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MEMORANDUM REPORT ARBRL-MR-02900

A COMBINATORIAL GEOMETRY COMPUTER
DESCRIPTION OF THE MEP-021A GENERATOR SET

John W. Roberts

February 1979



US ARMY ARMAMENT RESEARCH AND DEVELOPMENT COMMAND
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report documents a detailed computer description (COM-GEOM) of the MEP-021A Generator Set. The appendix contains the actual computer description of the MEP-021A. This description is also available at the BRL on either cards or magnetic tape. The shotline output of the GRID subroutine of the GIFT code is also stored on magnetic tape for future vulnerability analysis.		

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I. INTRODUCTION

This report documents a detailed Combinatorial Geometry (COM-GEOM) computer description of the MEP-021A 400 cycle (hz), 3 KW generator set. This COM-GEOM target description is used as input to the Geometric Information for Targets (GIFT)¹ computer code. The GIFT code traces shotlines through a COM-GEOM description from any specified attack aspect, listing pertinent information about each component hit. These shotline data are then used as simulated penetration paths through the target during a vulnerability analysis.

Internal combustion engines are a practical source of mechanical and electrical power for military weapons systems. Loss of power can render a weapon system useless, thus the power source qualifies as a critical system component and is deserving of vulnerability analysis.

An expedient vulnerability analysis of the MEP-021A generator set would be to represent the internal combustion engine and 400 hz generator as a box and cylinder having specified wall thickness. This approach is somewhat gross because it does not define components interior to the box or cylinder. If the interior components are geometrically defined, a refined vulnerability estimate can be made for the MEP-021A.

This computer description (COM-GEOM) defines geometrical shape, wall thickness and material of components that are external to the engine block such as spark plugs, spark plug wires, and fuel line. It also describes components that are internal to and masked by the engine block such as connecting rods, valve springs, crankshaft, and pistons. These internal components are usually neglected in COM-GEOM descriptions of internal combustion engines.

This description defines items in the 400 hz generator section such as the generator rotor, exciter rotor, ventilating fan, control box circuit breaker, and output terminals with their associated electric cables. The description defines the generator stator housing and control box sheet metal that mask the rotating components and electric cables.

¹L.W. Bain and M.J. Reisinger, "The GIFT Code User Manual, VOL 1, Introduction and Input Requirements," Ballistic Research Laboratory Report No. 1902, July 1975. (AD #B013219L)

II. SYSTEM DESCRIPTION

The Military Design DOD Model MEP-021A generator set (Figure 1) is a self-contained, frame mounted, portable unit. The generator is powered by a 4-cylinder, gasoline Military Standard Engine Model 4A032-I or 4A032-II which is directly coupled to a self-excited, 400 hz alternating current generator. The generator output is 120 or 240 volt, single phase; 120 volt 3-phase; or 120/208 volt, 3-phase, 4-wire and is rated at 3 kw.

For a detailed description of the engine and generator, the reader should consult the following Army Technical Manuals:

MEP-021A Engine: TM 5-2805-203-14

MEP-021A Generator: TM 5-6115-271-14
TM 5-6115-271-24P

These TM's contain operating and maintenance information, photographs, drawings, wiring diagrams, and parts list for the engine and generator.

Figure 2 is a COM-GEOM computer plot of the MEP-021A less the mounting frame, engine valve covers, and intake manifold cover. These components were omitted to illustrate engine components external to the engine block. Figure 3 is a computer plot of the complete MEP-021A target. The COM-GEOM description in this report will produce Figure 3 and includes components (valves, valve springs, intake manifold, etc) visible in Figure 2, but not visible in Figure 3.

Similarly, components internal to the engine block (crankshaft, pistons, etc) as well as the engine block itself are accounted for in the description although they are not visible in Figure 3. Components in the generator section (alternator rotor, exciter rotor, electric cables, etc) are included in the COM-GEOM description although they are not visible in Figure 3. The description consists of 282 geometrical bodies, mostly cylinders and boxes. The dimensions and name identifiers of the 282 bodies are listed in APPENDIX A.

III. VALIDATION PROCESS

In the process of producing a target description, errors are inevitably made. A thorough validation process was used to eliminate errors in the MEP-021A description.

First, this description was processed via the CHECK subroutine of the GIFT code. This subroutine checks for overlapping regions to any tolerance level. Overlapping errors result when regions occupy the same space. No overlapping regions were found in the MEP-021A description for a line of sight tolerance of 0.76 millimetre.

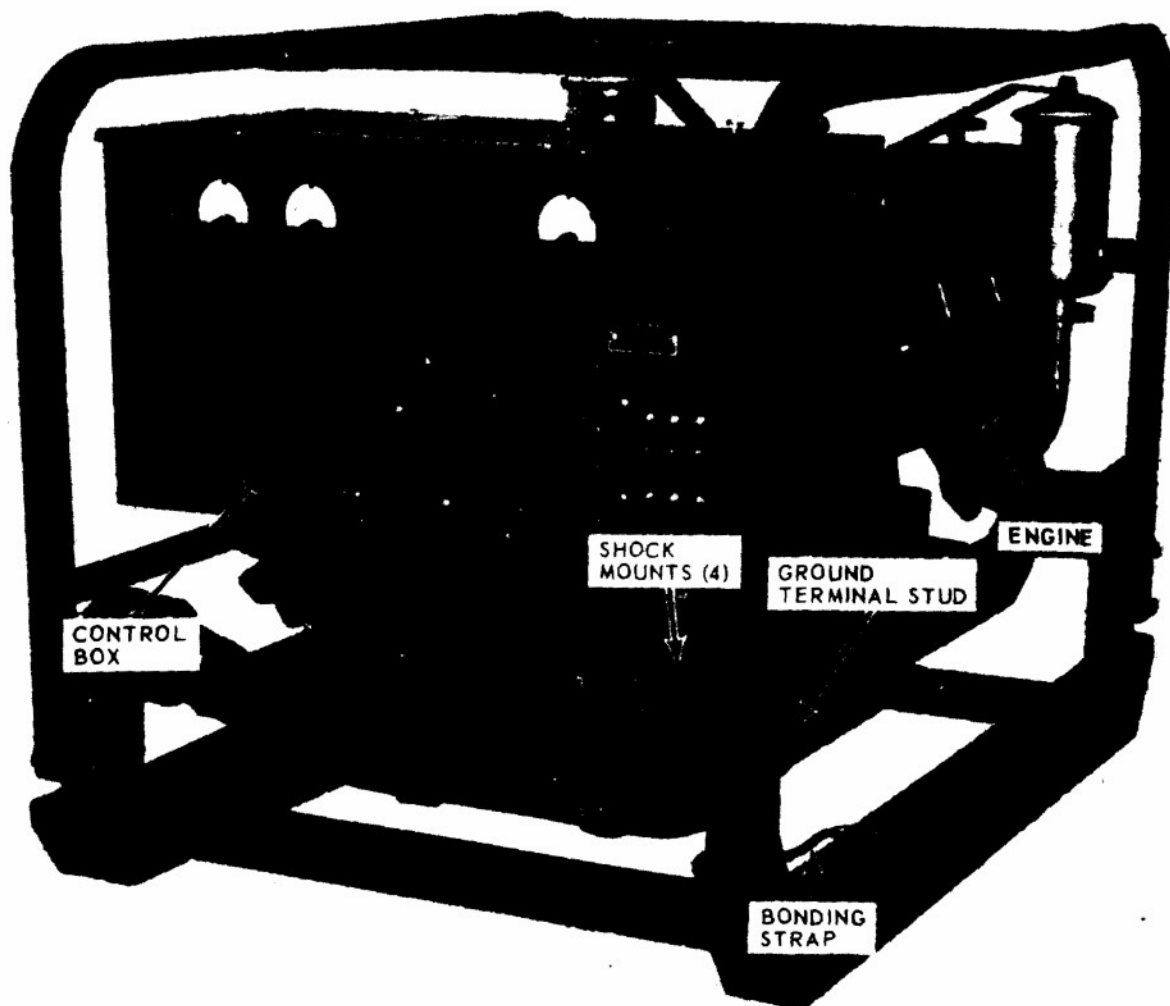
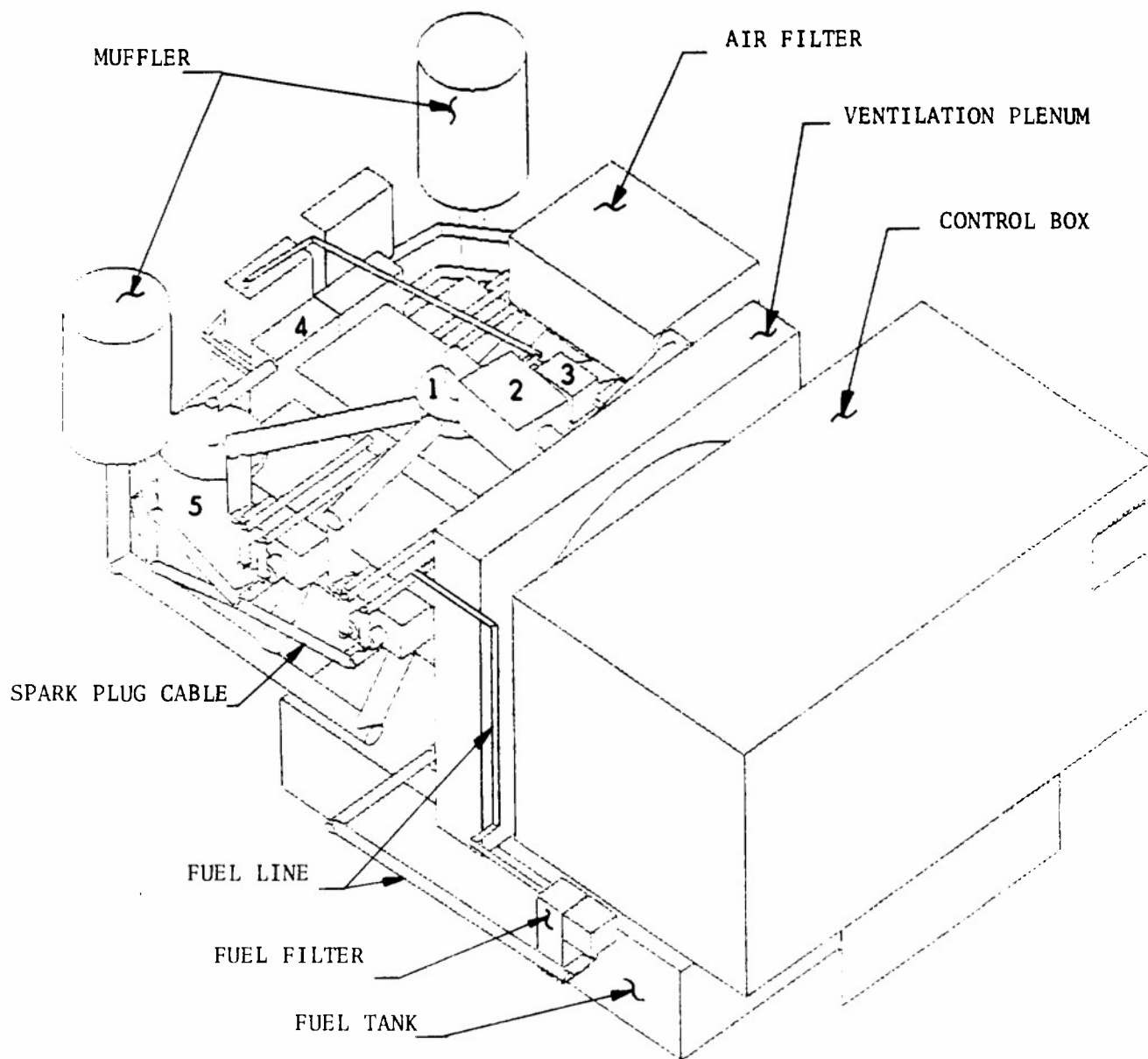


Figure 1. Model MEP-021A Generator Set



1 - INTAKE PLENUM
 2 - CARBURETOR
 3 - FUEL PUMP

4 - OIL PUMP
 5 - OIL FILTER

Figure 2. MEP-021A Computer Plot Less Mounting Frame, Valve Covers, and Intake Manifold Cover

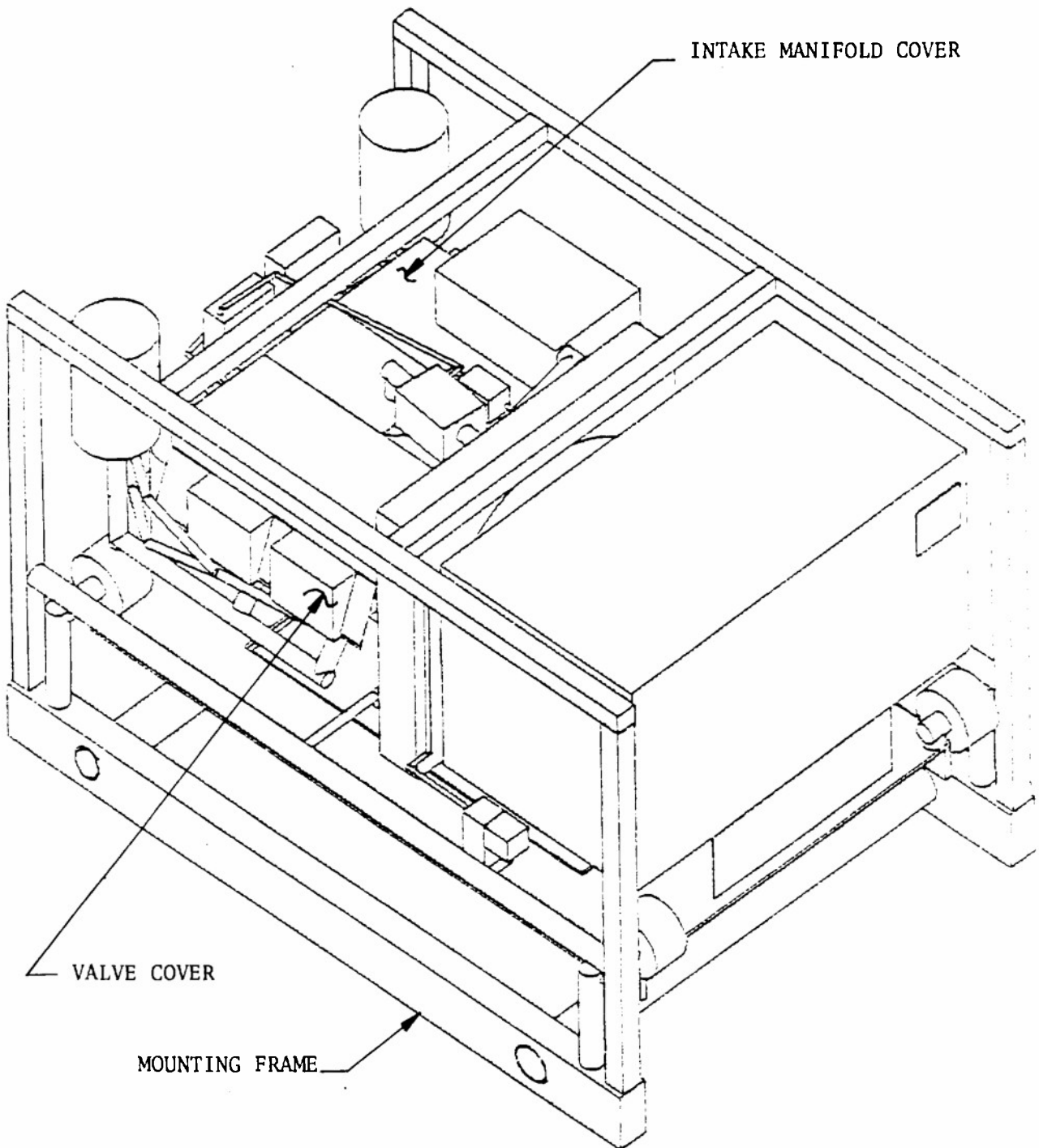


Figure 3. MEP-021A Computer Plot

In addition to overlapping, another error which may occur in target descriptions is the mislocation of a region. This type of error cannot be found by using the CHECK subroutine. The PICTUR subroutine of GIFT produces computer plots of one or more regions of a description. By carefully inspecting these plots, one can often find mislocation errors. Figures 2 and 3 are examples of the PICTUR subroutine output. All mislocation errors found in MEP-021A description have been eliminated.

An occasional problem in the target validation is the elimination of unwanted voids or undefined spaces. The GRID subroutine of the GIFT code is used to pinpoint this type of problem. GRID is the subroutine which traces shotlines completely through a description from any desired aspect; it lists the line-of-sight (LOS) thicknesses, the normal thicknesses and obliquity angles of every item encountered along each shotline. One of the many uses of this shotline information is in locating voids in the target description. All voids found in MEP-021A description have been eliminated.

IV. COORDINATE SYSTEM

The coordinate system, used in making the COM-GEOM description, was right handed and orthogonal. The positive direction of the axes is indicated in Figure 4. The origin of axes occurs where the crankshaft center line enters the ventilation plenum.

This report has presented a computer description (COM-GEOM) of the MEP-021A Generator Set in Appendix A. A brief introduction to COM-GEOM is given in Appendix B. For a detailed discussion of the COM-GEOM method, the reader is referred to Reference 1.

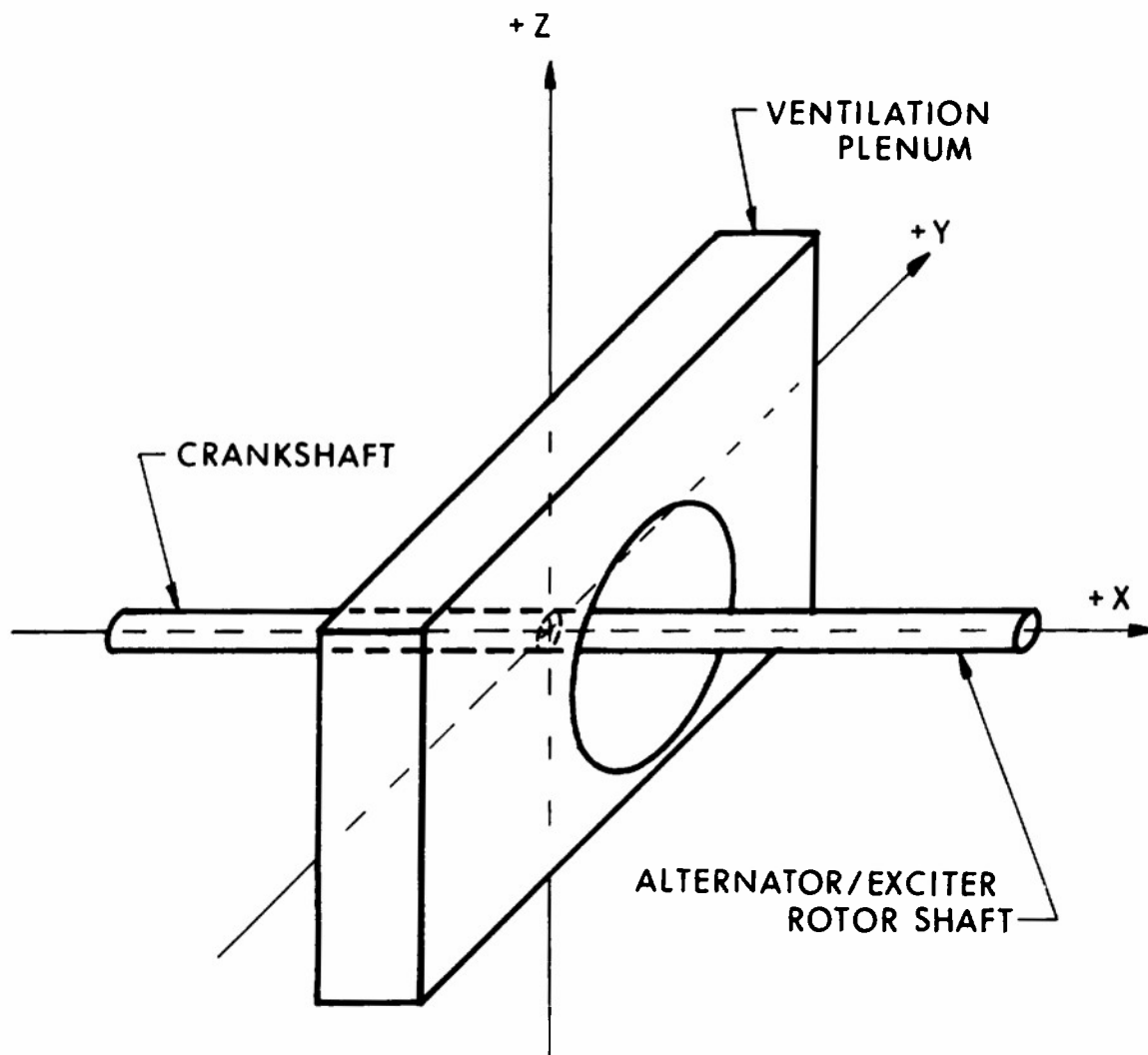


Figure 4. MEP-021A COORDINATE SYSTEM

APPENDIX A

COMPUTER TARGET DESCRIPTION OF THE MEP-021 GENERATOR SET

TABLE A-I. SOLID DATA FOR MEP G21A GENERATOR

SOLID NUM TYPE	SOLID PARAMETERS						REMARKS *
1 RCC	-303.0232	0.0000	0.0000	697.4867	0.0000	0.0000	CRANKSHAFT
	12.7001	0.0000	0.0000	0.0000	0.0000	0.0000	CRANKSHAFT
2 RCC	-303.0232	0.0000	50.8002	297.9432	0.0000	0.0000	CAMSHAFT
	12.7001	0.0000	0.0000	0.0000	0.0000	0.0000	CAMSHAFT
3 RCC	-200.0258	-12.7001	0.0000	0.0000	-38.1002	0.0000	1C-ROD CR
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	1C-ROD CR
4 RCC	-200.0258	-50.8002	0.0000	0.0000	-50.8002	0.0000	1C-ROD PI
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	1C-ROD PI
5 ARB8	-303.0232	-50.8002	-35.5601	-303.0232	-152.4006	-35.5601	1BLOCK
	-303.0232	-152.4006	35.5601	-303.0232	-50.8002	35.5601	12BLOCK
	-5.0800	-50.8002	-35.5601	-5.0800	-152.4006	-35.5601	12BLOCK
	-5.0800	-152.4006	35.5601	-5.0800	-50.8002	35.5601	12BLOCK
6 RCC	-200.0258	-50.8002	0.0000	0.0000	-50.8002	0.0000	1AIR C-ROD
	27.9401	0.0000	0.0000	0.0000	0.0000	0.0000	1AIR C-ROD
7 RCC	-200.0258	-101.6004	0.0000	0.0000	-35.5601	0.0000	1PISTON
	27.9401	0.0000	0.0000	0.0000	0.0000	0.0000	1PISTON
8 RCC	-200.0258	-142.2406	0.0000	0.0000	5.0800	0.0000	1AIR EXPLO
	27.9401	0.0000	0.0000	0.0000	0.0000	0.0000	1AIR EXPLO
9 ARB8	-235.5859	-152.4006	-5.0800	-235.5859	-187.9607	-5.0800	1VALVE COV
	-235.5859	-187.9607	35.5601	-235.5859	-152.4006	35.5601	1VALVE COV
	-164.4656	-152.4006	-5.0800	-164.4656	-187.9607	-5.0800	1VALVE COV
	-164.4656	-187.9607	35.5601	-164.4656	-152.4006	35.5601	1VALVE COV
10 ARB8	-230.5059	-152.4006	0.0000	-230.5059	-182.8807	0.0000	1AIR IN
	-230.5059	-182.8807	30.4801	-230.5059	-152.4006	30.4801	1AIR IN
	-202.5658	-152.4006	0.0000	-202.5658	-182.8807	0.0000	1AIR IN
	-202.5658	-182.8807	30.4801	-202.5658	-152.4006	30.4801	1AIR IN
11 RCC	-211.4558	-187.9607	10.1600	0.0000	35.5601	0.0000	1VALVE IN
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	1VALVE IN
12 RCC	-211.4558	-187.9607	10.1600	0.0000	-25.4001	0.0000	1PUSH R IN
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	1PUSH R IN
13 RCC	-211.4558	-209.5508	10.1600	0.0000	0.0000	44.4502	1PUSH R IN

* Integer(s) refer to specific combustion chamber(s).

TABLE A-I. SOLID DATA FOR MEP 021A GENERATOR(CONTINUED)

SOLID NUM TYPE	SOLID PARAMETERS						REMARKS
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	1PUSH R IN
14 RCC	-211.4558	-209.5508	50.8002	0.0000	196.8508	0.0000	1PUSH R IN
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	1PUSH R IN
15 ARB8	-202.5658	-152.4006	0.0000	-202.5658	-182.8807	0.0000	1DIVIDER
	-202.5658	-182.8807	30.4801	-202.5658	-152.4006	30.4801	1DIVIDER
	-197.4858	-152.4006	0.0000	-197.4858	-182.8807	0.0000	1DIVIDER
	-197.4858	-182.8807	30.4801	-197.4858	-152.4006	30.4801	1DIVIDER
16 ARB8	-197.4858	-152.4006	0.0000	-197.4858	-182.8807	0.0000	1AIR EXH
	-197.4858	-182.8807	30.4801	-197.4858	-152.4006	30.4801	1AIR EXH
	-169.5457	-152.4006	0.0000	-169.5457	-182.8807	0.0000	1AIR EXH
	-169.5457	-182.8807	30.4801	-169.5457	-152.4006	30.4801	1AIR EXH
17 RCC	-188.5957	-187.9607	10.1600	0.0000	35.5601	0.0000	1VALVE EXH
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	1VALVE EXH
18 RCC	-188.5957	-187.9607	10.1600	0.0000	-25.4001	0.0000	1PUSH R EX
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	1PUSH R EX
19 RCC	-188.5957	-209.5508	10.1600	0.0000	0.0000	44.4502	1PUSH R EX
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	1PUSH R EX
20 RCC	-188.5957	-209.5508	50.8002	0.0000	196.8508	0.0000	1PUSH R EX
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	1PUSH R EX
21 RCC	-200.0258	-152.4006	-15.2401	0.0000	-60.9602	0.0000	1SPARK PLU
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	1SPARK PLU
22 RCC	-211.4558	-187.9607	10.1600	0.0000	-15.2401	0.0000	1VAL SPR I
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	1VAL SPR I
23 RCC	-211.4558	-187.9607	10.1600	0.0000	-15.2401	0.0000	1SPR AIR I
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	1SPR AIR I
24 RCC	-188.5957	-187.9607	10.1600	0.0000	-15.2401	0.0000	1VAL SPR E
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	1VAL SPR E
25 RCC	-188.5957	-187.9607	10.1600	0.0000	-15.2401	0.0000	1SPR AIR E
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	1SPR AIR E
26 RCC	-79.3753	-12.7001	0.0000	0.0000	-38.1002	0.0000	2C-ROD CR
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	2C-ROD CR

TABLE A-I. SOLID DATA FOR MEP 021A GENERATOR (CONTINUED)

SOLID NUM TYPE	SOLID PARAMETERS						REMARKS
27 RCC	-79.3753	-50.8002	0.0000	0.0000	-50.8002	0.0000	2C-ROD PI
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	2C-ROD PI
28 RCC	-79.3753	-50.8002	0.0000	0.0000	-50.8002	0.0000	2AIR C-ROD
	27.9401	0.0000	0.0000	0.0000	0.0000	0.0000	2AIR C-ROD
29 RCC	-79.3753	-101.6004	0.0000	0.0000	-35.5601	0.0000	2PISTON
	27.9401	0.0000	0.0000	0.0000	0.0000	0.0000	2PISTON
30 RCC	-79.3753	-142.2406	0.0000	0.0000	5.0800	0.0000	2AIR EXPLO
	27.9401	0.0000	0.0000	0.0000	0.0000	0.0000	2AIR EXPLO
31 ARB8	-114.9355	-152.4006	-5.0800	-114.9355	-187.9607	-5.0800	2VALVE COV
	-114.9355	-187.9607	35.5601	-114.9355	-152.4006	35.5601	2VALVE COV
	-43.8152	-152.4006	-5.0800	-43.8152	-187.9607	-5.0800	2VALVE COV
	-43.8152	-187.9607	35.5601	-43.8152	-152.4006	35.5601	2VALVE COV
32 ARB8	-109.8554	-152.4006	0.0000	-109.8554	-182.8807	0.0000	2AIR IN
	-109.8554	-182.8807	30.4801	-109.8554	-152.4006	30.4801	2AIR IN
	-81.9153	-152.4006	0.0000	-81.9153	-182.8807	0.0000	2AIR IN
	-81.9153	-182.8807	30.4801	-81.9153	-152.4006	30.4801	2AIR IN
33 RCC	-90.8054	-187.9607	10.1600	0.0000	35.5601	0.0000	2VALVE IN
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	2VALVE IN
34 RCC	-90.8054	-187.9607	10.1600	0.0000	-25.4001	0.0000	2PUSH R IN
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	2PUSH R IN
35 RCC	-90.8054	-209.5508	10.1600	0.0000	0.0000	44.4502	2PUSH R IN
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	2PUSH R IN
36 RCC	-90.8054	-209.5508	50.8002	0.0000	196.8508	0.0000	2PUSH R IN
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	2PUSH R IN
37 ARB8	-81.9153	-152.4006	0.0000	-81.9153	-182.8807	0.0000	2DIVIDER
	-81.9153	-182.8807	30.4801	-81.9153	-152.4006	30.4801	2DIVIDER
	-76.8353	-152.4006	0.0000	-76.8353	-182.8807	0.0000	2DIVIDER
	-76.8353	-182.8807	30.4801	-76.8353	-152.4006	30.4801	2DIVIDER
38 ARB8	-76.8353	-152.4006	0.0000	-76.8353	-182.8807	0.0000	2AIR EXH
	-76.8353	-182.8807	30.4801	-76.8353	-152.4006	30.4801	2AIR EXH
	-48.8952	-152.4006	0.0000	-48.8952	-182.8807	0.0000	2AIR EXH

TABLE A-I. SOLID DATA FOR MEP 021A GENERATOR(CONTINUED)

SOLID NUM TYPE	SOLID PARAMETERS						REMARKS
	-48.8952	-182.8807	30.4801	-48.8952	-152.4006	30.4801	2AIR EXH
39 RCC	-67.9453	-187.9607	10.1600	0.0000	35.5601	0.0000	2VALVE EXH
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	2VALVE EXH
40 RCC	-67.9453	-187.9607	10.1600	0.0000	-25.4001	0.0000	2PUSH R EX
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	2PUSH R EX
41 RCC	-67.9453	-209.5508	10.1600	0.0000	0.0000	44.4502	2PUSH R EX
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	2PUSH R EX
42 RCC	-67.9453	-209.5508	50.8002	0.0000	196.8508	0.0000	2PUSH R EX
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	2PUSH R EX
43 RCC	-79.3753	-152.4006	-15.2401	0.0000	-60.9602	0.0000	2SPARK PLU
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	2SPARK PLU
44 RCC	-90.8054	-187.9607	10.1600	0.0000	-15.2401	0.0000	2VAL SPR I
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	2VAL SPR I
45 RCC	-90.8054	-187.9607	10.1600	0.0000	-15.2401	0.0000	2SPR AIR I
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	2SPR AIR I
46 RCC	-67.9453	-187.9607	10.1600	0.0000	-15.2401	0.0000	2VAL SPR E
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	2VAL SPR E
47 RCC	-67.9453	-187.9607	10.1600	0.0000	-15.2401	0.0000	2SPR AIR E
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	2SPR AIR E
48 RCC	-247.6510	12.7001	0.0000	0.0000	38.1002	0.0000	3C-ROD CR
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	3C-ROD CR
49 RCC	-247.6510	50.8002	0.0000	0.0000	50.8002	0.0000	3C-ROD PI
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	3C-ROD PI
50 ARBH	-303.0232	152.4006	-35.5601	-303.0232	50.8002	-35.5601	34BLOCK
	-303.0232	50.8002	35.5601	-303.0232	152.4006	35.5601	34BLOCK
	-5.0800	152.4006	-35.5601	-5.0800	50.8002	-35.5601	34BLOCK
	-5.0800	50.8002	35.5601	-5.0800	152.4006	35.5601	34BLOCK
51 RCC	-247.6510	101.6004	0.0000	0.0000	-50.8002	0.0000	3AIR C-ROD
	27.9401	0.0000	0.0000	0.0000	0.0000	0.0000	3AIR C-ROD
52 RCC	-247.6510	101.6004	0.0000	0.0000	35.5601	0.0000	3PISTON
	27.9401	0.0000	0.0000	0.0000	0.0000	0.0000	3PISTON

TABLE A-I. SOLID DATA FOR MEP 021A GENERATOR(CONTINUED)

SOLID NUM TYPE	SOLID PARAMETERS						REMARKS
53 RCC	-247.6510	142.2406	0.0000	0.0000	-5.0800	0.0000	3AIR EXPLO
	27.9401	0.0000	0.0000	0.0000	0.0000	0.0000	3AIR EXPLO
54 ARB8	-283.2111	187.9607	-5.0800	-283.2111	152.4006	-5.0800	3VALVE COV
	-283.2111	152.4006	35.5601	-283.2111	187.9607	35.5601	3VALVE COV
	-212.0908	187.9607	-5.0800	-212.0908	152.4006	-5.0800	3VALVE COV
	-212.0908	152.4006	35.5601	-212.0908	187.9607	35.5601	3VALVE COV
55 ARB8	-278.1311	182.8807	0.0000	-278.1311	152.4006	0.0000	3AIR EXH
	-278.1311	152.4006	30.4801	-278.1311	182.8807	30.4801	3AIR EXH
	-250.1910	182.8807	0.0000	-250.1910	152.4006	0.0000	3AIR EXH
	-250.1910	152.4006	30.4801	-250.1910	182.8807	30.4801	3AIR EXH
56 RCC	-259.0810	187.9607	10.1600	0.0000	-35.5601	0.0000	3VALVE EXH
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	3VALVE EXH
57 RCC	-259.0810	187.9607	10.1600	0.0000	25.4001	0.0000	3PUSH R EX
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	3PUSH R EX
58 RCC	-259.0810	209.5508	10.1600	0.0000	0.0000	44.4502	3PUSH R EX
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	3PUSH R EX
59 RCC	-259.0810	209.5508	50.8002	0.0000	-196.8508	0.0000	3PUSH R EX
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	3PUSH R EX
60 ARB8	-250.1910	182.8807	0.0000	-250.1910	152.4006	0.0000	3DIVIDER
	-250.1910	152.4006	30.4801	-250.1910	182.8807	30.4801	3DIVIDER
	-245.1110	182.8807	0.0000	-245.1110	152.4006	0.0000	3DIVIDER
	-245.1110	152.4006	30.4801	-245.1110	182.8807	30.4801	3DIVIDER
61 ARB8	-245.1110	182.8807	0.0000	-245.1110	152.4006	0.0000	3AIR IN
	-245.1110	152.4006	30.4801	-245.1110	182.8807	30.4801	3AIR IN
	-217.1709	182.8807	0.0000	-217.1709	152.4006	0.0000	3AIR IN
	-217.1709	152.4006	30.4801	-217.1709	182.8807	30.4801	3AIR IN
62 RCC	-236.2209	187.9607	10.1600	0.0000	-35.5601	0.0000	3VALVE IN
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	3VALVE IN
63 RCC	-236.2209	187.9607	10.1600	0.0000	25.4001	0.0000	3PUSH R IN
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	3PUSH R IN
64 RCC	-236.2209	209.5508	10.1600	0.0000	0.0000	44.4502	3PUSH R IN

TABLE A-I. SOLID DATA FOR MEP C21A GENERATOR(CONTINUED)

SOLID NUM TYPE	SOLID PARAMETERS						REMARKS
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	3PUSH R IN
65 RCC	-236.2209	209.5506	50.8002	0.0000	-196.8506	0.0000	3PUSH R IN
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	3PUSH R IN
66 RCC	-247.6510	152.4006	-15.2401	0.0000	60.9602	0.0000	3SPARK PLU
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	3SPARK PLU
67 RCC	-259.0810	187.9607	10.1600	0.0000	15.2401	0.0000	3VAL SPR E
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	3VAL SPR E
68 RCC	-259.0810	187.9607	10.1600	0.0000	15.2401	0.0000	3SPR AIR E
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	3SPR AIR E
69 RCC	-236.2209	187.9607	10.1600	0.0000	15.2401	0.0000	3VAL SPR I
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	3VAL SPR I
70 RCC	-236.2209	187.9607	10.1600	0.0000	15.2401	0.0000	3SPR AIR I
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	3SPR AIR I
71 RCC	-127.0005	12.7001	0.0000	0.0000	38.1002	0.0000	4C-ROD CR
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	4C-ROD CR
72 RCC	-127.0005	50.8002	0.0000	0.0000	50.8002	0.0000	4C-ROD PI
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	4C-ROD PI
73 RCC	-127.0005	101.6004	0.0000	0.0000	-50.8002	0.0000	4AIR C-ROD
	27.9401	0.0000	0.0000	0.0000	0.0000	0.0000	4AIR C-ROD
74 RCC	-127.0005	101.6004	0.0000	0.0000	35.5601	0.0000	4PISTON
	27.9401	0.0000	0.0000	0.0000	0.0000	0.0000	4PISTON
75 RCC	-127.0005	142.2406	0.0000	0.0000	-5.0800	0.0000	4AIR EXPLO
	27.9401	0.0000	0.0000	0.0000	0.0000	0.0000	4AIR EXPLO
76 ARB8	-162.5606	187.9607	-5.0800	-162.5606	152.4006	-5.0800	4VALVE COV
	-162.5606	152.4006	35.5601	-162.5606	187.9607	35.5601	4VALVE COV
	-91.4404	187.9607	-5.0800	-91.4404	152.4006	-5.0800	4VALVE COV
	-91.4404	152.4006	35.5601	-91.4404	187.9607	35.5601	4VALVE COV
77 ARB8	-157.4806	182.8807	0.0000	-157.4806	152.4006	0.0000	4AIR EXH
	-157.4806	152.4006	30.4801	-157.4806	182.8807	30.4801	4AIR EXH
	-129.5405	182.8807	0.0000	-129.5405	152.4006	0.0000	4AIR EXH
	-129.5405	152.4006	30.4801	-129.5405	182.8807	30.4801	4AIR EXH

TABLE A-I. SOLID DATA FOR MEP Q21A GENERATOR(CONTINUED)

SOLID NUM TYPE	SOLID PARAMETERS						REMARKS
78 RCC	-138.4305	187.9607	10.1600	0.0000	-35.5601	0.0000	4VALVE EXH
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	4VALVE EXH
79 RCC	-138.4305	187.9607	10.1600	0.0000	25.4001	0.0000	4PUSH R EX
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	4PUSH R EX
80 RCC	-138.4305	209.5508	10.1600	0.0000	0.0000	44.4502	4PUSH R EX
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	4PUSH R EX
81 RCC	-138.4305	209.5508	50.8002	0.0000	-196.8508	0.0000	4PUSH R EX
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	4PUSH R EX
82 ARB8	-129.5405	182.8807	0.0000	-129.5405	152.4006	0.0000	4DIVIDER
	-129.5405	152.4006	30.4801	-129.5405	182.8807	30.4801	4DIVIDER
	-124.4605	182.8807	0.0000	-124.4605	152.4006	0.0000	4DIVIDER
	-124.4605	152.4006	30.4801	-124.4605	182.8807	30.4801	4DIVIDER
83 ARB8	-124.4605	182.8807	0.0000	-124.4605	152.4006	0.0000	4AIR IN
	-124.4605	152.4006	30.4801	-124.4605	182.8807	30.4801	4AIR IN
	-91.9484	182.8807	0.0000	-91.9484	152.4006	0.0000	4AIR IN
	-91.9484	152.4006	30.4801	-91.9484	182.8807	30.4801	4AIR IN
84 RCC	-115.5705	187.9607	10.1600	0.0000	-35.5601	0.0000	4VALVE IN
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	4VALVE IN
85 RCC	-115.5705	187.9607	10.1600	0.0000	25.4001	0.0000	4PUSH R IN
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	4PUSH R IN
86 RCC	-115.5705	209.5508	10.1600	0.0000	0.0000	44.4502	4PUSH R IN
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	4PUSH R IN
87 RCC	-115.5705	209.5508	50.8002	0.0000	-196.8508	0.0000	4PUSH R IN
	3.8100	0.0000	0.0000	0.0000	0.0000	0.0000	4PUSH R IN
88 RCC	-127.0005	152.4006	-15.2401	0.0000	60.9602	0.0000	4SPARK PLU
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	4SPARK PLU
89 RCC	-138.4305	187.9607	10.1600	0.0000	15.2401	0.0000	4VAL SPR E
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	4VAL SPR E
90 RCC	-138.4305	187.9607	10.1600	0.0000	15.2401	0.0000	4SPR AIR E
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	4SPR AIR E
91 RCC	-115.5705	187.9607	10.1600	0.0000	15.2401	0.0000	4VAL SPR I

TABLE A-I. SOLID DATA FOR MEP 021A GENERATOR(CONTINUED)

SOLID NUM TYPE	SOLID PARAMETERS						REMARKS
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	4VAL SPR I
92 RCC	-115.5705	167.9607	10.1600	0.0000	15.2401	0.0000	4SPR AIR I
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	4SPR AIR I
93 RPP	-205.1922	-30.4801	104.1506	230.0639	106.6804	185.4207	AIRFILT
94 RPP	-203.6682	-32.0041	105.6746	228.5399	108.2044	183.8967	AIRFILT A
95 RCC	-30.4801	116.8405	172.7207	25.4001	0.0000	0.0000	AF-CARB P*
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	AF-CARB P
96 RCC	-15.2401	116.8405	172.7207	0.0000	-141.8418	-38.1865	AF-CARB P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	AF-CARB P
97 RCC	-15.2401	-15.2401	137.1605	-34.2571	3.5560	0.0000	AF-CARB P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	AF-CARB P
98 ARBb	-124.2319	24.9505	106.6804	-130.1450	-32.2607	106.6804	CARB
	-130.1450	-32.2607	160.2746	-124.2319	24.9505	160.2746	CARB
	-46.5406	16.9215	106.6804	-52.4537	-40.2896	106.6804	CARB
	-52.4537	-40.2896	160.2746	-46.5406	16.9215	160.2746	CARB
99 RCC	-127.1885	-3.6551	137.1605	-45.4763	4.6990	0.0000	CARB-PLP P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	CARB-PLP P
100 RCC	-162.5606	0.0000	137.1605	0.0000	0.0000	-35.5601	CARB-PLP P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	CARB-PLP P
101 RCC	-162.5606	0.0000	101.6004	0.0000	0.0000	-20.3201	INTAKE PLE
	35.5601	0.0000	0.0000	0.0000	0.0000	0.0000	INTAKE PLE
102 RCC	-180.2162	-30.8687	91.4404	-83.2717	-145.5908	0.0000	1INTAKE P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	1INTAKE P
103 RCC	-258.4460	-167.6407	91.4404	0.0000	0.0000	-86.3603	1INTAKE P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	1INTAKE P
104 RCC	-258.4460	-167.6407	15.2401	12.7001	0.0000	0.0000	1INTAKE P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	1INTAKE P
105 RCC	-157.3663	-35.1791	91.4404	21.0541	-142.5123	0.0000	2INTAKE P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	2INTAKE P
106 RCC	-137.7955	-167.6407	91.4404	0.0000	0.0000	-86.3603	2INTAKE P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	2INTAKE P

*"p" is abbreviation for "pipe".

TABLE A-I. SOLID DATA FOR MEP C21A GENERATOR (CONTINUED)

SOLID NUM TYPE	SOLID PARAMETERS						REMARKS
107 RCC	-137.7955	-167.6407	15.2401	12.7001	0.0000	0.0000	2INTAKE P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	2INTAKE P
108 RCC	-168.1436	35.1182	91.4404	-22.6823	142.5555	0.0000	3INTAKE P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	3INTAKE P
109 RCC	-169.2307	167.6407	91.4404	0.0000	0.0000	-86.3603	3INTAKE P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	3INTAKE P
110 RCC	-189.2307	167.6407	15.2401	-12.7001	0.0000	0.0000	3INTAKE P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	3INTAKE P
111 RCC	-145.1768	31.0211	91.4404	81.5648	145.4816	0.0000	4INTAKE P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	4INTAKE P
112 RCC	-68.5803	167.6407	91.4404	0.0000	0.0000	-86.3603	4INTAKE P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	4INTAKE P
113 RCC	-68.5803	167.6407	15.2401	-12.7001	0.0000	0.0000	4INTAKE P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	4INTAKE P
114 RCC	-357.5318	-214.5191	77.7243	0.0000	0.0000	146.1217	12MUFFLER
	46.6346	0.0000	0.0000	0.0000	0.0000	0.0000	12MUFFLER
115 RCC	-357.5318	-214.5191	77.7243	0.0000	0.0000	-168.7176	12EXH P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	12EXH P
116 RCC	-357.5318	-214.5191	-80.8333	306.7316	0.0000	0.0000	12EXH P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	12EXH P
117 RCC	-60.9602	-214.5191	-80.8333	0.0000	48.7707	68.2424	2EXH P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	2EXH P
118 RCC	-60.9602	-167.6407	-18.4964	0.0000	0.0000	13.4163	2EXH P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	2EXH P
119 RCC	-182.8807	-208.6110	-72.5681	0.0000	42.8627	59.9773	1EXH P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	1EXH P
120 RCC	-182.8807	-167.6407	-18.4964	0.0000	0.0000	13.4163	1EXH P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	1EXH P
121 RCC	-357.5318	214.5191	77.7243	0.0000	0.0000	146.1217	34MUFFLER
	46.6346	0.0000	0.0000	0.0000	0.0000	0.0000	34MUFFLER
122 RCC	-357.5318	214.5191	77.7243	0.0000	0.0000	-168.7176	34EXH P

TABLE A-1. SOLID DATA FOR MEP 021A GENERATOR (CONTINUED)

SOLID NUM TYPE	SOLID PARAMETERS						REMARKS
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	34EXH P
123 RCC	-357.5318	214.5191	-80.8333	222.9113	0.0000	0.0000	34EXH P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	34EXH P
124 RCC	-144.7806	214.5191	-80.8333	0.0000	-48.7707	68.2424	4EXH P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	4EXH P
125 RCC	-144.7806	167.6407	-18.4964	0.0000	0.0000	13.4163	4EXH P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	4EXH P
126 RCC	-264.1610	208.6110	-72.5681	0.0000	-42.8627	59.9773	3EXH P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	3EXH P
127 RCC	-264.1610	167.6407	-18.4964	0.0000	0.0000	13.4163	3EXH P
	10.1600	0.0000	0.0000	0.0000	0.0000	0.0000	3EXH P
128 RPP	-382.3325	-335.6979	-76.9471	76.9471	-54.3562	54.3562	MAGNETO
129 RCC	-365.7614	-76.9471	-40.6402	0.0000	-108.5930	0.0000	1SPK PLU C *
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	1SPK PLU C
130 RCC	-367.9484	-181.3643	-40.6402	69.6318	-48.2068	0.0000	1SPK PLU C
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	1SPK PLU C
131 RCC	-301.3747	-228.6009	-41.0618	106.2715	0.0000	27.0740	1SPK PLU C
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	1SPK PLU C
132 RCC	-200.0258	-228.6009	-15.2401	0.0000	15.2401	0.0000	1SPK PLU C
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	1SPK PLU C
133 RCC	-365.7614	-76.9471	25.4001	0.0000	-108.5930	0.0000	2SPK PLU C
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	2SPK PLU C
134 RCC	-367.9484	-181.3643	25.4001	69.5661	-48.1738	0.0000	2SPK PLU C
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	2SPK PLU C
135 RCC	-301.3442	-228.6009	25.6998	226.9651	0.0000	-41.8594	2SPK PLU C
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	2SPK PLU C
136 RCC	-79.3753	-228.6009	-15.2401	0.0000	15.2401	0.0000	2SPK PLU C
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	2SPK PLU C
137 RCC	-365.7614	76.9471	-25.4001	0.0000	108.5930	0.0000	3SPK PLU C
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	3SPK PLU C
138 RCC	-367.9484	181.3643	-25.4001	69.5937	48.1789	0.0000	3SPK PLU C

* "C" is abbreviation for "Cable".

TABLE A-1. SOLID DATA FOR MEP 021A GENERATOR (CONTINUED)

SOLID NUM TYPE	SOLID PARAMETERS						REMARKS
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	3SPK PLU C
139 RCC	-301.3493	228.6009	-25.7176	58.6644	0.0000	11.4504	3SPK PLU C
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	3SPK PLU C
140 RCC	-247.6510	228.6009	-15.2401	0.0000	-15.2401	0.0000	3SPK PLU C
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	3SPK PLU C
141 RCC	-365.7614	76.9471	40.6402	0.0000	108.5905	-15.6211	4SPK PLU C
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	4SPK PLU C
142 RCC	-367.9662	181.3516	25.4001	69.6369	48.2094	0.0000	4SPK PLU C
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	4SPK PLU C
143 RCC	-301.3671	228.6009	25.7862	179.3120	0.0000	-42.1896	4SPK PLU C
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	4SPK PLU C
144 RCC	-127.0005	228.6009	-15.2401	0.0000	-15.2401	0.0000	4SPK PLU C
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	4SPK PLU C
145 RCC	-345.4414	76.2003	40.6402	0.0000	20.3201	0.0000	MAG-IPTS C
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	MAG-IPTS C
146 RCC	-345.4414	91.4404	40.6402	0.0000	0.0000	35.5601	MAG-IPTS C
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	MAG-IPTS C
147 RPP	-365.7614	-335.6979	15.2401	96.5204	76.2003	162.5606	IGNIT PTS
148 RCC	-309.2716	-147.6762	45.7202	0.0000	0.0000	-137.1605	OIL FILTER
	43.1802	0.0000	0.0000	0.0000	0.0000	0.0000	OIL FILTER
149 RCC	-309.2716	-147.6762	45.7202	0.0000	0.0000	46.7362	OILF-PUM P
	6.0960	0.0000	0.0000	0.0000	0.0000	0.0000	OILF-PUM P
150 RCC	-309.2716	-147.6762	86.3603	0.0000	70.7291	0.0000	OILF-PUM P
	6.0960	0.0000	0.0000	0.0000	0.0000	0.0000	OILF-PUM P
151 RCC	-315.3676	-91.4404	86.3603	-63.0938	0.0000	0.0000	GOV OILL P
	2.5400	0.0000	0.0000	0.0000	0.0000	0.0000	GOV OILL P
152 RCC	-375.9215	-91.4404	86.3603	0.0000	98.9766	26.0453	GOV OILL P
	2.5400	0.0000	0.0000	0.0000	0.0000	0.0000	GOV OILL P
153 RCC	-375.9215	5.0800	111.7604	22.6601	0.0000	0.0000	GOV OILL P
	2.5400	0.0000	0.0000	0.0000	0.0000	0.0000	GOV OILL P
154 RCC	-355.6014	5.0800	111.7604	0.0000	-5.0800	0.0000	GOV OILL P

TABLE A-I. SOLID DATA FOR MEP 021A GENERATOR(CONTINUED)

SOLID NUM TYPE	SOLID PARAMETERS						REMARKS
	2.5400	0.0000	0.0000	0.0000	0.0000	0.0000	GOV DILL P
155 RPP	-365.7614	-335.6979	-76.2003	0.0000	76.2003	147.3206	GOVERNOR
156 RCC	-347.9814	-68.5803	147.3206	0.0000	0.0000	10.1600	GOVCARB LK
	2.5400	0.0000	0.0000	0.0000	0.0000	0.0000	GOVCARB LK
157 RCC	-347.9814	-68.5803	154.9406	5.2172	78.2856	0.0000	GOVCARB LK
	2.5400	0.0000	0.0000	0.0000	0.0000	0.0000	GOVCARB LK
158 RCC	-344.9740	7.3559	154.8923	244.1915	31.0542	5.4331	GOVCARB LK
	2.5400	0.0000	0.0000	0.0000	0.0000	0.0000	GOVCARB LK
159 RCC	-103.2387	38.1002	160.2746	-1.5697	-15.1562	-5.3340	GOVCARB LK
	2.5400	0.0000	0.0000	0.0000	0.0000	0.0000	GOVCARB LK
160 RPP	-208.8803	267.3716	-168.1487	168.1487	-287.5799	-179.6295	FUEL TANK
161 RPP	-207.3563	265.8476	-166.6247	166.6247	-286.0559	-181.1535	FUEL T AIR
162 RCC	-56.4797	-136.3985	-179.6295	0.0000	0.0000	23.0430	FUE LIN P
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	FUE LIN P
163 RCC	-56.4797	-136.3985	-161.6666	0.0000	-127.7625	0.0000	FUE LIN P
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	FUE LIN P
164 RCC	-56.4797	-259.0810	-161.6666	279.9955	0.0000	10.2896	FUE LIN P
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	FUE LIN P
165 RCC	216.4409	-259.0810	-151.5624	0.0000	35.6617	0.0000	FUE LIN P
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	FUE LIN P
166 RCC	216.4409	-228.4993	-151.5624	0.0000	0.0000	21.0059	FUE LIN P
	5.0800	0.0000	0.0000	0.0000	0.0000	0.0000	FUE LIN P
167 RPP	202.0832	236.2819	-244.0442	-212.9544	-130.5565	-99.4871	FUEL VALVE
168 RPP	170.9935	202.0832	-244.0442	-212.9544	-175.2607	-99.4871	FUEL FILTE
169 RCC	170.9935	-228.4993	-111.1508	-95.8092	0.0000	0.0000	FUEL F-P P
	2.5400	0.0000	0.0000	0.0000	0.0000	0.0000	FUEL F-P P
170 RCC	77.7243	-228.4993	-111.1508	0.0000	32.0549	0.0000	FUEL F-P P
	2.5400	0.0000	0.0000	0.0000	0.0000	0.0000	FUEL F-P P
171 RCC	77.7243	-198.9844	-111.1508	0.0000	0.0000	241.1587	FUEL F-P P
	2.5400	0.0000	0.0000	0.0000	0.0000	0.0000	FUEL F-P P
172 RCC	77.7243	-198.9844	127.4679	-94.2547	0.0000	0.0000	FUEL F-P P

TABLE A-I. SOLID DATA FOR MEP 021A GENERATOR(CONTINUED)

SOLID NUM TYPE	SOLID PARAMETERS						REMARKS
173 RCC	2.5400	0.0000	0.0000	0.0000	0.0000	0.0000	FUEL F-P P
	-13.9904	-198.9844	127.4679	0.0000	262.4821	-10.7290	FUEL F-P P
174 RCC	2.5400	0.0000	0.0000	0.0000	0.0000	0.0000	FUEL F-P P
	-13.9904	60.9602	116.8405	-47.2950	0.0000	0.0000	FUEL F-P P
175 RPP	2.5400	0.0000	0.0000	0.0000	0.0000	0.0000	FUEL F-P P
	-107.9199	-61.2854	36.5304	67.6151	106.6804	139.7006	FUEL PUMP
176 RCC	-107.9199	60.9602	116.8405	-31.7755	0.0000	0.0000	FUEL P-C P
177 RCC	2.5400	0.0000	0.0000	0.0000	0.0000	0.0000	FUEL P-C P
	-137.1605	60.9602	116.8405	2.4486	-42.1743	0.0000	FUEL P-C P
178 RCC	2.5400	0.0000	0.0000	0.0000	0.0000	0.0000	FUEL P-C P
	-136.9853	21.1634	116.8405	12.2301	-1.2649	0.0000	FUEL P-C P
179 RPP	2.5400	0.0000	0.0000	0.0000	0.0000	0.0000	FUEL P-C P
	0.0000	54.4070	-192.7563	192.7563	-170.9935	186.5383	VENTPLENUM
180 RPP	1.5240	52.8830	-191.2323	191.2323	-169.4695	185.0143	VENTPL AIR
181 TRC	74.7271	0.0000	0.0000	-38.1002	0.0000	0.0000	VENTIL FAN
182 RCC	151.1306	45.5119	0.0000	0.0000	0.0000	0.0000	VENTIL FAN
	74.7271	0.0000	0.0000	25.4001	0.0000	0.0000	VENTIL FAN
183 RCC	151.1306	0.0000	0.0000	0.0000	0.0000	0.0000	VENTIL FAN
	54.4070	0.0000	0.0000	85.4967	0.0000	0.0000	FANHOUSING
184 RCC	157.1758	0.0000	0.0000	0.0000	0.0000	0.0000	FANHOUSING
	54.4070	0.0000	0.0000	80.9247	0.0000	0.0000	FANHOU AIR
185 RCC	152.4006	0.0000	0.0000	0.0000	0.0000	0.0000	FANHOU AIR
	135.3317	0.0000	0.0000	248.0193	0.0000	0.0000	GENHOUSING
186 RCC	120.6505	0.0000	0.0000	0.0000	0.0000	0.0000	GENHOUSING
	135.3317	0.0000	0.0000	161.7351	0.0000	0.0000	GENHOU AIR
187 RCC	111.3794	0.0000	0.0000	0.0000	0.0000	0.0000	GENHOU AIR
	297.0669	0.0000	0.0000	71.9966	0.0000	0.0000	GENHOU AIR
188 RCC	89.1544	0.0000	0.0000	0.0000	0.0000	0.0000	GENHOU AIR
	369.0635	-43.7796	43.7796	14.2876	0.0000	0.0000	AIR VENT
189 RCC	30.1626	0.0000	0.0000	0.0000	0.0000	0.0000	AIR VENT
	369.0635	43.7796	44.0082	14.2876	0.0000	0.0000	AIR VENT

TABLE A-1. SOLID DATA FOR MEP 021A GENERATOR(CONTINUED)

SOLID NUM TYPE	SOLID PARAMETERS						REMARKS
	30.1626	0.0000	0.0000	0.0000	0.0000	0.0000	AIR VENT
190 RCC	369.0635	-43.7796	-43.7796	14.2876	0.0000	0.0000	AIR VENT
	30.1626	0.0000	0.0000	0.0000	0.0000	0.0000	AIR VENT
191 RCC	369.0635	43.7796	-43.7796	14.2876	0.0000	0.0000	AIR VENT
	30.1626	0.0000	0.0000	0.0000	0.0000	0.0000	AIR VENT
192 RCC	394.4636	0.0000	0.0000	-25.4001	0.0000	0.0000	BEARING
	31.7501	0.0000	0.0000	0.0000	0.0000	0.0000	BEARING
193 RCC	123.0609	0.0000	0.0000	129.9799	0.0000	0.0000	GENERATOR
	110.1094	0.0000	0.0000	0.0000	0.0000	0.0000	GENERATOR
194 RCC	279.1141	0.0000	0.0000	80.7088	0.0000	0.0000	GENEXCITER
	80.7088	0.0000	0.0000	0.0000	0.0000	0.0000	GENEXCITER
195 RPP	155.2962	416.7547	-245.1110	-132.0805	0.0000	2.2860	CB CHASSIS
196 RPP	155.2962	416.7547	-132.0805	132.0805	0.0000	132.0805	CB CHASSIS
197 RPP	155.2962	416.7547	-129.7945	129.7945	2.2860	129.7945	CB CHA AIR
198 RPP	155.2962	416.7547	132.0805	245.1110	0.0000	2.2860	CB CHASSIS
199 RPP	147.6762	424.3747	-247.6510	247.6510	-45.0801	248.7178	CONTROLBOX
200 RPP	149.9622	422.0887	-245.3650	245.3650	-42.7941	246.4318	CB AIR
201 RPP	422.0887	424.3747	-131.8265	131.8265	-138.2985	-45.0801	CB FLAP
202 RCC	188.0522	0.0000	120.6505	0.0000	0.0000	25.4001	GEN CB C
	6.3500	0.0000	0.0000	0.0000	0.0000	0.0000	GEN CB C
203 RCC	188.0522	0.0000	139.7006	208.3624	0.0000	0.0000	CB C
	6.3500	0.0000	0.0000	0.0000	0.0000	0.0000	CB C
204 RCC	390.0846	0.0000	139.7006	0.0000	219.7109	0.0000	CB C
	6.3500	0.0000	0.0000	0.0000	0.0000	0.0000	CB C
205 RCC	390.0846	213.3608	139.7006	-163.6681	0.0000	0.0000	CB C
	6.3500	0.0000	0.0000	0.0000	0.0000	0.0000	CB C
206 RCC	232.7665	213.3608	139.7006	0.0000	0.0000	23.9269	CB C
	6.3500	0.0000	0.0000	0.0000	0.0000	0.0000	CB C
207 RCC	232.7665	213.3608	157.2774	0.0000	34.2901	0.0000	CB C
	6.3500	0.0000	0.0000	0.0000	0.0000	0.0000	CB C
208 RPP	160.3762	300.0768	247.6510	250.1910	134.4173	185.2175	CB OUTTERM

TABLE A-I. SOLID DATA FOR MEP 021A GENERATOR(CONTINUED)

SOLID NUM TYPE	SOLID PARAMETERS						REMARKS
209 RCC	390.0846	203.2008	146.0506	0.0000	0.0000	36.6269	CB C
	6.3500	0.0000	0.0000	0.0000	0.0000	0.0000	CB C
210 RCC	390.0846	203.2008	176.3275	31.7501	0.0000	0.0000	CB C
	6.3500	0.0000	0.0000	0.0000	0.0000	0.0000	CB C
211 RPP	424.3747	426.9147	171.4507	234.9509	147.1174	210.6176	CB CKTBREA
212 RCC	319.4698	0.0000	120.6505	0.0000	0.0000	12.7001	EXCIT CB C
	6.3500	0.0000	0.0000	0.0000	0.0000	0.0000	EXCIT CB C
213 RPP	-335.6979	-303.0232	-76.9471	0.0000	-91.4404	96.5204	OIL PUMP
214 RPP	-335.6979	-303.0232	0.0000	76.9471	-91.4404	96.5204	CAM DRIVE
215 RPP	-5.0800	0.0000	-76.9471	76.9471	-91.4404	96.5204	END PLATE
216 RPP	-303.0232	-5.0800	-55.8802	55.8802	35.5601	71.1203	CAM COVER
217 RPP	-303.0232	-5.0800	-50.8002	50.8002	35.5601	66.0403	CAM COVAIR
218 RPP	-303.0232	-5.0800	-55.8802	55.8802	-91.4404	-35.5601	OIL PAN
219 RPP	-303.0232	-5.0800	-50.8002	50.8002	-86.3603	-35.5601	OIL PAN AIR
220 RCC	-211.4558	-55.8802	50.8002	0.0000	-96.5204	0.0000	1PRCOV INT
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	1PRCOV INT
221 RCC	-168.5957	-55.8802	50.8002	0.0000	-96.5204	0.0000	1PRCOV EXH
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	1PRCOV EXH
222 RPP	-245.7460	-154.3056	-223.5209	-152.4006	-7.6200	71.1203	1VALVE COV
223 RPP	-241.3010	-156.8456	-220.9809	-154.9406	-5.0800	68.5803	1VALCOVAIR
224 RCC	-90.8054	-55.8802	50.8002	0.0000	-96.5204	0.0000	2PRCOV INT
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	2PRCOV INT
225 RCC	-67.9453	-55.8802	50.8002	0.0000	-96.5204	0.0000	2PRCOV EXH
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	2PRCOV EXH
226 RPP	-125.0955	-33.6551	-223.5209	-152.4006	-7.6200	71.1203	2VALVE COV
227 RPP	-122.5555	-36.1951	-220.9809	-154.9406	-5.0800	68.5803	2VALCOVAIR
228 RCC	-259.0810	55.8802	50.8002	0.0000	96.5204	0.0000	+PRCOV EXH
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	+PRCOV EXH
229 RCC	-236.2209	55.8802	50.8002	0.0000	96.5204	0.0000	3PRCOV INT
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	3PRCOV INT
230 RPP	-293.3712	-201.9308	152.4006	223.5209	-7.6200	71.1203	3VALVE COV

TABLE A-I. SOLID DATA FOR MEP 021A GENERATOR(CONTINUED)

SOLID NUM TYPE	SOLID PARAMETERS						REMARKS
231 RPP	-290.8311	-204.4708	154.9406	220.9809	-5.0800	68.5803	3VALCOVAIR
232 RCC	-138.4305	55.8802	50.8002	0.0000	96.5204	0.0000	4PRCOV EXH
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	4PRCOV EXH
233 RCC	-115.5705	55.8802	50.8002	0.0000	96.5204	0.0000	4PRCOV INT
	7.6200	0.0000	0.0000	0.0000	0.0000	0.0000	4PRCOV INT
234 RPP	-172.7207	-81.2803	152.4006	223.5209	-7.6200	71.1203	4VALVE COV
235 RPP	-170.1807	-78.7403	154.9406	220.9809	-5.0800	68.5803	4VALCOVAIR
236 RCC	-374.4686	-287.9254	-281.3620	0.0000	0.0000	138.6134	RF SHOCK M
	12.7001	0.0000	0.0000	0.0000	0.0000	0.0000	RF SHOCK M
237 RCC	-374.4686	-287.9254	-155.4486	0.0000	83.2006	0.0000	RF SHOCK M
	12.7001	0.0000	0.0000	0.0000	0.0000	0.0000	RF SHOCK M
238 RCC	-374.4686	-217.4249	-155.4486	0.0000	0.0000	-20.2083	RF SHOCK M
	12.7001	0.0000	0.0000	0.0000	0.0000	0.0000	RF SHOCK M
239 RCC	399.5029	-287.9254	-281.3620	0.0000	0.0000	138.6134	RR SHOCK M
	12.7001	0.0000	0.0000	0.0000	0.0000	0.0000	RR SHOCK M
240 RCC	399.5029	-287.9254	-155.4486	0.0000	83.2006	0.0000	RR SHOCK M
	12.7001	0.0000	0.0000	0.0000	0.0000	0.0000	RR SHOCK M
241 RCC	399.5029	-217.4249	-155.4486	0.0000	0.0000	-20.2083	RR SHOCK M
	12.7001	0.0000	0.0000	0.0000	0.0000	0.0000	RR SHOCK M
242 RCC	-374.4686	287.9254	-281.3620	0.0000	0.0000	138.6134	LF SHOCK M
	12.7001	0.0000	0.0000	0.0000	0.0000	0.0000	LF SHOCK M
243 RCC	-374.4686	287.9254	-155.4486	0.0000	-83.2006	0.0000	LF SHOCK M
	12.7001	0.0000	0.0000	0.0000	0.0000	0.0000	LF SHOCK M
244 RCC	-374.4686	217.4249	-155.4486	0.0000	0.0000	-20.2083	LF SHOCK M
	12.7001	0.0000	0.0000	0.0000	0.0000	0.0000	LF SHOCK M
245 RCC	399.5029	287.9254	-281.3620	0.0000	0.0000	138.6134	LR SHOCK M
	12.7001	0.0000	0.0000	0.0000	0.0000	0.0000	LR SHOCK M
246 RCC	399.5029	287.9254	-155.4486	0.0000	-83.2006	0.0000	LR SHOCK M
	12.7001	0.0000	0.0000	0.0000	0.0000	0.0000	LR SHOCK M
247 RCC	399.5029	217.4249	-155.4486	0.0000	0.0000	-20.2083	LR SHOCK M
	12.7001	0.0000	0.0000	0.0000	0.0000	0.0000	LR SHOCK M

TABLE A-I. SOLID DATA FOR MEP 021A GENERATOR(CONTINUED)

SOLID NUM TYPE	SOLID PARAMETERS						REMARKS
248 RPP	-387.1686	412.5687	-230.1249	230.1249	-182.0070	-175.6569	CRADLE
249 RPP	-215.9009	273.0511	-172.7207	172.7207	-182.0070	-175.6569	CRADLE AIR
250 RPP	-342.0479	-335.6979	-76.9471	-25.4001	-175.6569	-54.3562	ENG SUPPORT
251 RPP	-342.0479	-335.6979	25.4001	76.9471	-175.6569	-54.3562	ENG SUPPORT
252 RPP	96.5204	106.6804	-25.4001	25.4001	-175.6569	-157.1758	GEN SUPPORT
253 RPP	-431.9846	457.0189	-306.5792	-269.2715	-359.0863	-281.3620	RIGHT SKID
254 RPP	-431.9846	-406.5845	-300.6254	-275.2253	-281.3620	250.5161	RTSIDFRAME
255 RPP	-431.9846	457.0189	-300.6254	-275.2253	250.5161	275.9162	RTSIDFRAME
256 RPP	431.6188	457.0189	-300.6254	-275.2253	-281.3620	250.5161	RTSIDFRAME
257 RCC	-406.5845	-287.9254	-116.5865	838.2033	0.0000	0.0000	RTSIDFRAME
	12.7001	0.0000	0.0000	0.0000	0.0000	0.0000	RTSIDFRAME
258 RPP	-431.9846	457.0189	269.2715	306.5792	-359.0863	-281.3620	LEFT SKID
259 RPP	-431.9846	-406.5845	275.2253	300.6254	-281.3620	250.5161	LTSIDFRAME
260 RPP	-431.9846	457.0189	275.2253	300.6254	250.5161	275.9162	LTSIDFRAME
261 RPP	431.6188	457.0189	275.2253	300.6254	-281.3620	250.5161	LTSIDFRAME
262 RCC	-406.5845	287.9254	-116.5865	838.2033	0.0000	0.0000	LTSIDFRAME
	12.7001	0.0000	0.0000	0.0000	0.0000	0.0000	LTSIDFRAME
263 RPP	-233.1729	-207.7728	-275.2253	275.2253	250.5161	275.9162	FCROSSFRAME
264 RPP	98.9588	124.3589	-275.2253	275.2253	250.5161	275.9162	RCROSSFRAME
265 RCC	-374.4686	-275.2253	-155.4486	0.0000	45.1004	0.0000	RFSHOCKABS
	38.1002	0.0000	0.0000	0.0000	0.0000	0.0000	RFSHOCKABS
266 RCC	399.5029	-275.2253	-155.4486	0.0000	45.1004	0.0000	RRSHOCKABS
	38.1002	0.0000	0.0000	0.0000	0.0000	0.0000	RRSHOCKABS
267 RCC	-374.4686	275.2253	-155.4486	0.0000	-45.1004	0.0000	LFSHOCKABS
	38.1002	0.0000	0.0000	0.0000	0.0000	0.0000	LFSHOCKABS
268 RCC	399.5029	275.2253	-155.4486	0.0000	-45.1004	0.0000	LRSHOCKABS
	38.1002	0.0000	0.0000	0.0000	0.0000	0.0000	LRSHOCKABS
269 RPP	-303.0232	-5.0800	-187.9607	-50.8002	71.1203	106.6804	RIGHTCOVER
270 RPP	-300.4832	-7.6200	-185.4207	-50.8002	71.1203	104.1404	RT COV AIR
271 ARBB	-303.0232	-187.9607	64.0083	-303.0232	-213.3608	-7.6200	RTSIDE COV
	-303.0232	-213.3608	-5.0800	-303.0232	-187.9607	71.1203	RTSIDE COV

TABLE A-1. SOLID DATA FOR MEP 021A GENERATOR(CONTINUED)

SOLID NUM TYPE		SOLID PARAMETERS						REMARKS
		-5.0800	-187.9607	64.0083	-5.0800	-213.3608	-7.6200	RTSIDE COV
		-5.0800	-213.3608	-5.0800	-5.0800	-187.9607	71.1203	RTSIDE COV
272	RPP	-303.0232	-5.0800	50.8002	187.9607	71.1203	106.6804	LEFT COVER
273	RPP	-300.4832	-7.6200	50.8002	185.4207	71.1203	104.1404	LT COV AIR
274	ARB8	-303.0232	213.3608	-7.6200	-303.0232	187.9607	64.0083	LTSIDE COV
		-303.0232	187.9607	71.1203	-303.0232	213.3608	-5.0800	LTSIDE COV
		-5.0800	213.3608	-7.6200	-5.0800	187.9607	64.0083	LTSIDE COV
		-5.0800	187.9607	71.1203	-5.0800	213.3608	-5.0800	LTSIDE COV
275	RPP	-303.0232	-132.0805	-50.8002	50.8002	104.1404	106.6804	MIDDLE COV
276	RPP	-387.1686	412.5687	-230.1249	-220.4729	-226.4571	-182.0070	RIGHT STIF
277	RPP	-387.1686	412.5687	220.4729	230.1249	-226.4571	-182.0070	LEFT STIFF
278	RCC	-310.8972	-306.5792	-320.2241	0.0000	613.1584	0.0000	FRONT PIPE
		23.3173	0.0000	0.0000	0.0000	0.0000	0.0000	FRONT PIPE
279	RCC	-310.8972	-306.5792	-320.2241	0.0000	613.1584	0.0000	FRONT PAIR
		20.9856	0.0000	0.0000	0.0000	0.0000	0.0000	FRONT PAIR
280	RCC	327.9966	-306.5792	-320.2241	0.0000	613.1584	0.0000	REAR PIPE
		23.3173	0.0000	0.0000	0.0000	0.0000	0.0000	REAR PIPE
281	RCC	327.9966	-306.5792	-320.2241	0.0000	613.1584	0.0000	REAR PIAIR
		20.9856	0.0000	0.0000	0.0000	0.0000	0.0000	REAR PIAIR
282	RPP	-207.3563	265.8476	-166.6247	166.6247	-286.0559	-190.5008	FUEL

TABLE A-II. REGION DATA FOR MEP 021A GENERATOR

REG NUM	REGION COMBINATION DATA									REMARKS
1	1	0	0	0	0	0	0	0	0	0 CRANKSHAFT
2	2	0	0	0	0	0	0	0	0	0 CAMSHAFT
3	3	0	0	0	0	0	0	0	0	0 1C-ROD CR
4	4	0	0	0	0	0	0	0	0	0 1C-ROD PI
5	5	-6	-7	-8	-28	-29	-30	-148	0	0 12BLOCK
6	6	0	0	0	0	0	0	0	0	0 1AIR C-ROD
7	7	0	0	0	0	0	0	0	0	0 1PISTON
8	8	0	0	0	0	0	0	0	0	0 1AIR EXPLOS
9	9	-10	-11	-15	-16	-17	0	0	0	0 1VALVE COVE
10	10	0	0	0	0	0	0	0	0	0 1AIR IN
11	11	-9	0	0	0	0	0	0	0	0 1VALVE IN
12	12	-22	0	0	0	0	0	0	0	0 1PUSH R IN
13	13	-12	-14	0	0	0	0	0	0	0 1PUSH R IN
14	14	-216	-217	-2	-222	-223	-220	0	0	0 1PUSH R IN
15	15	0	0	0	0	0	0	0	0	0 1DIVIDER
16	16	0	0	0	0	0	0	0	0	0 1AIR EXH
17	17	-9	0	0	0	0	0	0	0	0 1VALVE EXH
18	18	-24	0	0	0	0	0	0	0	0 1PUSH R EX
19	19	-18	-20	0	0	0	0	0	0	0 1PUSH R EXH
20	20	-216	-217	-2	-222	-223	-221	0	0	0 1PUSH R EXH
21	21	0	0	0	0	0	0	0	0	0 1SPARK PL
22	22	0	0	0	0	0	0	0	0	0 1VAL SPR IN
23	23	0	0	0	0	0	0	0	0	0 1SPR AIR IN
24	24	0	0	0	0	0	0	0	0	0 1VAL SPR EX
25	25	0	0	0	0	0	0	0	0	0 1SPR AIR EX
26	26	0	0	0	0	0	0	0	0	0 2C-ROD CR
27	27	0	0	0	0	0	0	0	0	0 2C-ROD PI
28	28	0	0	0	0	0	0	0	0	0 2AIR C ROD
29	29	0	0	0	0	0	0	0	0	0 2PISTON
30	30	0	0	0	0	0	0	0	0	0 2AIR EXPLOS
31	31	-32	-33	-37	-38	-39	0	0	0	0 2VALVE COVE

TABLE A-II. REGION DATA FOR MEP 021A GENERATOR(CONTINUED)

REG NUM	REGION COMBINATION DATA								REMARKS
32	32	0	0	0	0	C	0	0	0 2AIR IN
33	33	-31	0	0	0	0	0	0	0 2VALVE IN
34	34	-44	0	0	0	0	C	0	0 2PUSH R IN
35	35	-34	-36	0	0	0	0	0	0 2PUSH R IN
36	36	-216	-217	-2	-226	-227	-224	0	0 2PUSH R IN
37	37	0	0	0	0	0	0	0	0 2DIVIDER
38	38	0	0	0	0	0	0	0	0 2AIR EXH
39	39	-31	0	0	0	0	0	0	0 2VALVE EXH
40	40	-46	0	0	0	0	0	0	0 2PUSH R EX
41	41	-40	-42	0	0	0	0	0	0 2PUSH R EXH
42	42	-216	-217	-2	-226	-227	-225	0	0 2PUSH R EXH
43	43	0	0	0	0	0	0	0	0 2SPARK PL
44	44	0	0	0	0	0	0	0	0 2VAL SPR IN
45	45	0	0	0	0	0	0	0	0 2SPR AIR IN
46	46	0	0	0	0	0	0	0	0 2VAL SPR EX
47	47	0	0	0	0	0	0	0	0 2SPR AIR EX
48	48	0	0	0	0	0	0	0	0 3C-ROD CR
49	49	0	0	0	0	0	0	0	0 3C-ROD PI
50	50	-51	-52	-53	-73	-74	-75	0	0 34BLOCK
51	51	0	0	0	0	0	0	0	0 3AIR C-ROD
52	52	0	0	0	0	0	0	0	0 3PISTON
53	53	0	0	0	0	0	0	0	0 3AIR EXPLOS
54	54	-55	-56	-60	-61	-62	0	0	0 3VALVE COV
55	55	0	0	0	0	0	0	0	0 3AIR EXH
56	56	-54	0	0	0	0	0	0	0 3VALVE EXH
57	57	-67	0	0	0	0	0	0	0 3PUSH R EX
58	58	-57	-59	0	0	0	0	0	0 3PUSH R EXH
59	59	-216	-217	-2	-230	-231	-228	0	0 3PUSH R EXH
60	60	0	0	0	0	0	0	0	0 3DIVIDER
61	61	0	0	0	0	0	0	0	0 3AIR IN
62	62	-54	0	0	0	0	0	0	0 3VALVE IN

TABLE A-II. REGION DATA FOR MEP C21A GENERATOR(CONTINUED)

REG NUM	REGION COMBINATION DATA								REMARKS
63	63	-69	0	0	0	C	0	0	0 3PUSH R IN
64	64	-63	-65	0	C	0	0	0	0 3PUSH R IN
65	65	-216	-217	-2	-230	-231	-229	C	0 3PUSH R IN
66	66	0	0	0	0	C	0	0	0 3SPARK PLUG
67	67	C	C	C	C	C	0	0	0 3VAL SPR EX
68	68	0	0	0	0	C	0	0	0 3SPR AIR EX
69	69	0	0	C	C	0	0	0	0 3VAL SPR IN
70	70	0	0	0	0	C	0	C	0 3SPR AIR IN
71	71	0	0	C	0	0	0	0	0 4C-ROD CR
72	72	C	0	0	C	C	C	0	0 4C-ROD PI
73	73	0	0	0	C	C	0	0	0 4AIR C-ROD
74	74	C	C	C	0	0	C	0	0 4PISTON
75	75	C	C	C	0	0	0	0	0 4AIR EXPLOS
76	76	-77	-78	-82	-83	-84	0	0	0 4VALVE COVE
77	77	0	0	0	0	C	C	0	0 4AIR EXH
78	78	-76	0	0	0	C	0	C	0 4VALVE EXH
79	79	-89	0	0	C	C	0	0	0 4PUSH R EX
80	80	-79	-81	0	C	0	0	0	0 4PUSH R EXH
81	81	-216	-217	-2	-234	-235	-232	0	0 4PUSH R EXH
82	82	C	0	0	C	C	0	0	0 4DIVIDER
83	83	0	0	C	0	C	0	0	0 4AIR IN
84	84	-76	C	0	0	C	0	0	0 4VALVE IN
85	85	-91	C	C	0	0	0	C	0 4PUSH R IN
86	86	-85	-87	C	0	0	0	0	0 4PUSH R IN
87	87	-216	-217	-2	-234	-235	-233	0	0 4PUSH R IN
88	88	C	C	0	0	C	0	0	0 4SPARK PLUG
89	89	0	0	0	0	C	0	0	0 4VAL SPR EX
90	90	0	C	C	0	C	0	C	0 4SPR AIR EX
91	91	C	C	C	0	C	0	0	0 4VAL SPR IN
92	92	C	C	0	0	C	0	0	0 4SPR AIR IN
93	93	-94	C	0	C	C	0	0	0 AIRFILT

TABLE A-II. REGION DATA FOR MEP 021A GENERATOR(CONTINUED)

REG NUM	REGION COMBINATION DATA									REMARKS
94	94	0	0	0	0	0	0	0	0	AIRFILT A
95	95	0	0	0	0	0	0	0	0	AF-CARB P
96	96	-95	-97	0	0	0	0	0	0	AF-CARB P
97	97	0	0	0	0	0	0	0	0	AF-CARB P
98	98	0	0	0	0	0	0	0	0	CARB
99	99	0	0	0	0	0	0	0	0	CARB-PLP P
100	100	-99	0	0	0	0	0	0	0	CARB-PLP P
101	101	0	0	0	0	0	0	0	0	INTAKE PLP
102	102	0	0	0	0	0	0	0	0	1INTAKE P
103	103	-102	-104	0	0	0	0	0	0	1INTAKE P
104	104	0	0	0	0	0	0	0	0	1INTAKE P
105	105	0	0	0	0	0	0	0	0	2INTAKE P
106	106	-105	-107	0	0	0	0	0	0	2INTAKE P
107	107	0	0	0	0	0	0	0	0	2INTAKE P
108	108	0	0	0	0	0	0	0	0	3INTAKE P
109	109	-108	-110	0	0	0	0	0	0	3INTAKE P
110	110	0	0	0	0	0	0	0	0	3INTAKE P
111	111	0	0	0	0	0	0	0	0	4INTAKE P
112	112	-111	-113	0	0	0	0	0	0	4INTAKE P
113	113	0	0	0	0	0	0	0	0	4INTAKE P
114	114	0	0	0	0	0	0	0	0	12MUFFLER
115	115	0	0	0	0	0	0	0	0	12EXH P
116	116	-117	-115	0	0	0	0	0	0	12EXH P
117	117	0	0	0	0	0	0	0	0	2EXH P
118	118	-226	-227	-117	0	0	0	0	0	2EXH P
119	119	0	0	0	0	0	0	0	0	1EXH P
120	120	-222	-223	-119	0	0	0	0	0	1EXH P
121	121	0	0	0	0	0	0	0	0	34MUFFLER
122	122	0	0	0	0	0	0	0	0	34EXH P
123	123	-124	-122	0	0	0	0	0	0	34EXH P
124	124	0	0	0	0	0	0	0	0	4EXH P

TABLE A-II. REGION DATA FOR MEP 021A GENERATOR(CONTINUED)

REG NUM	REGION COMBINATION DATA								REMARKS
125	125	-234	-235	-124	0	0	0	0	0 4EXH P
126	126	0	0	0	0	0	0	0	0 3EXH P
127	127	-230	-231	-126	0	0	0	0	0 3EXH P
128	128	-141	0	0	0	0	0	0	0 MAGNETO
129	129	0	0	0	0	0	0	0	0 1SPK PLU C
130	130	-129	-131	0	0	0	0	0	0 1SPK PLU C
131	131	0	0	0	0	0	0	0	0 1SPK PLU C
132	132	-131	0	0	0	0	0	0	0 1SPK PLU C
133	133	0	0	0	0	0	0	0	0 2SPK PLU C
134	134	-133	-135	0	0	0	0	0	0 2SPK PLU C
135	135	0	0	0	0	0	0	0	0 2SPK PLU C
136	136	-135	0	0	0	0	0	0	0 2SPK PLU C
137	137	0	0	0	0	0	0	0	0 3SPK PLU C
138	138	-137	-139	0	0	0	0	0	0 3SPK PLU C
139	139	0	0	0	0	0	0	0	0 3SPK PLU C
140	140	-139	0	0	0	0	0	0	0 3SPK PLU C
141	141	0	0	0	0	0	0	0	0 4SPK PLU C
142	142	-141	-143	0	0	0	0	0	0 4SPK PLU C
143	143	0	0	0	0	0	0	0	0 4SPK PLU C
144	144	-143	0	0	0	0	0	0	0 4SPK PLU C
145	145	-146	0	0	0	0	0	0	0 MAG-IPTS C
146	146	0	0	0	0	0	0	0	0 MAG-IPTS C
147	147	0	0	0	0	0	0	0	0 IGNIT PTS
148	148	0	0	0	0	0	0	0	0 OIL FILTER
149	149	-150	0	0	0	0	0	0	0 OILF-PUM P
150	150	0	0	0	0	0	0	0	0 OILF-PUM P
151	151	0	0	0	0	0	0	0	0 GOV OILL P
152	152	-151	-153	0	0	0	0	0	0 GOV OILL P
153	153	0	0	0	0	0	0	0	0 GOV OILL P
154	154	-153	0	0	0	0	0	0	0 GOV OILL P
155	155	0	0	0	0	0	0	0	0 GOVERNOR

TABLE A-II. REGION DATA FOR MEP 021A GENERATOR(CONTINUED)

REG NUM	REGION COMBINATION DATA									REMARKS
156	156	0	0	0	0	0	0	0	0	GOVCARB LK
157	157	-156	-158	0	0	0	0	0	0	GOVCARB LK
158	158	0	0	0	0	0	0	0	0	GOVCARB LK
159	159	-158	0	0	0	0	0	0	0	GOVCARB LK
160	160	-161	0	0	0	0	0	0	0	FUEL TANK
161	161	0	0	0	0	0	0	0	0	FUEL T AIR
162	162	0	0	0	0	0	0	0	0	FUE LIN P
163	163	-162	-164	0	0	0	0	0	0	FUE LIN P
164	164	0	0	0	0	0	0	0	0	FUE LIN P
165	165	-164	-166	0	0	0	0	0	0	FUE LIN P
166	166	0	0	0	0	0	0	0	0	FUE LIN P
167	167	0	0	0	0	0	0	0	0	FUEL VALVE
168	168	0	0	0	0	0	0	0	0	FUEL FILTE
169	169	0	0	0	0	0	0	0	0	FUEL F-P P
170	170	-169	-171	0	0	0	0	0	0	FUEL F-P P
171	171	0	0	0	0	0	0	0	0	FUEL F-P P
172	172	-171	-173	0	0	0	0	0	0	FUEL F-P P
173	173	0	0	0	0	0	0	0	0	FUEL F-P P
174	174	-173	0	0	0	0	0	0	0	FUEL F-P P
175	175	0	0	0	0	0	0	0	0	FUEL PUMP
176	176	0	0	0	0	0	0	0	0	FUEL P-C P
177	177	-176	-178	0	0	0	0	0	0	FUEL P-C P
178	178	0	0	0	0	0	0	0	0	FUEL P-C P
179	179	-180	-181	-1	0	0	0	0	0	VENTPLENUM
180	180	0	0	0	0	0	0	0	0	VENTPL AIR
181	181	-1	0	0	0	0	0	0	0	VENTIL FAN
182	182	-1	0	0	0	0	0	0	0	VENTIL FAN
183	183	-184	-185	0	0	0	0	0	0	FANHOUSING
184	184	0	0	0	0	0	0	0	0	FANHOU AIR
185	185	-186	-187	-192	-188	-189	-190	-191	0	GENHOUSING
186	186	0	0	0	0	0	0	0	0	GENHOU AIR

TABLE A-II. REGION DATA FOR MEP 021A GENERATOR(CONTINUED)

REG NUM	REGION COMBINATION DATA								REMARKS
187	187	C	0	0	C	0	0	0	0 GENHOU AIR
188	188	0	0	C	0	C	0	0	0 AIR VENT
189	189	C	C	C	0	C	C	0	0 AIR VENT
190	190	0	0	C	C	0	0	0	0 AIR VENT
191	191	0	0	C	0	C	0	0	0 AIR VENT
192	192	-1	0	0	0	C	C	0	0 BEARING
193	193	-1	C	0	C	C	0	0	0 GENERATOR
194	194	-1	0	0	0	0	0	0	0 GENEXCITER
195	195	0	0	0	C	0	0	0	0 CB CHASSIS
196	196	-197	-185	-202	-212	-1	-192	0	0 CB CHASSIS
197	197	0	0	0	0	C	0	0	0 CB CHA AIR
198	198	0	0	0	0	C	0	0	0 CB CHASSIS
199	199	-200	-185	-207	-210	C	0	0	0 CONTROLBOX
200	200	0	0	0	0	C	0	0	0 CB AIR
201	201	0	0	0	0	C	C	0	0 CB FLAP
202	202	0	0	0	0	C	0	0	0 GEN CB C
203	203	-202	-204	0	0	C	C	0	0 CB C
204	204	0	0	0	C	C	0	0	0 CB C
205	205	-204	-206	0	C	0	0	0	0 CB C
206	206	0	0	0	0	0	0	0	0 CB C
207	207	-206	0	0	0	0	0	0	0 CB C
208	208	0	0	0	C	C	0	0	0 CB OUTTERM
209	209	-210	C	C	C	C	C	0	0 CB C
210	210	0	0	C	C	C	0	0	0 CB C
211	211	0	0	C	0	C	0	0	0 CB CKTBREA
212	212	C	C	0	0	0	0	0	0 EXCIT CB C
213	213	-1	C	0	C	C	C	0	0 OIL PUMP
214	214	-1	0	0	C	C	C	0	0 CAM DRIVE
215	215	-1	0	0	C	C	0	C	0 END PLATE
216	216	-217	-11	-17	-33	-39	-56	-62	-78 CAM COVER
	-84	C	0	0	0	0	0	0	0 CAM COVER

TABLE A-II. REGION DATA FOR MEP C21A GENERATOR(CONTINUED)

REG NUM	REGION COMBINATION DATA								REMARKS
217	217	0	0	0	C	C	0	0	0 CAM COVAIR
218	218	-219	0	0	0	0	0	0	0 OIL PAN
219	219	0	0	0	C	C	0	0	0 OIL PANAIR
220	220	-14	0	0	C	C	C	0	0 1PRCOV INT
221	221	-20	0	C	C	C	C	0	0 1PRCOV EXH
222	222	-223	-9	C	0	C	0	C	0 1VALVE COV
223	223	0	0	0	0	C	0	0	0 1VALCOVAIR
224	224	-36	0	0	0	C	C	0	0 2PRCOV INT
225	225	-42	0	0	C	C	C	0	0 2PRCOV EXH
226	226	-227	-31	0	C	C	0	0	0 2VALVE COV
227	227	0	C	0	C	C	C	C	0 2VALCOVAIR
228	228	-59	0	0	C	C	0	0	0 3PRCOV EXH
229	229	-65	0	0	0	C	0	0	0 3PRCOV INT
230	230	-231	-54	0	C	C	0	0	0 3VALVE COV
231	231	0	0	0	C	C	0	0	0 3VALCOVAIR
232	232	81	0	0	C	C	0	0	0 4PRCOV EXH
233	233	87	0	0	0	0	0	0	0 4PRCOV INT
234	234	-235	-76	C	0	0	0	0	0 4VALVE COV
235	235	0	0	0	C	C	0	0	0 4VALCOVAIR
236	236	0	C	0	0	C	0	0	0 RF SHOCK M
237	237	-236	-238	C	C	C	0	0	0 RF SHOCK M
238	238	0	0	0	C	0	0	0	0 RF SHOCK M
239	239	0	C	0	C	C	C	0	0 RR SHOCK M
240	240	-239	-241	0	C	C	C	0	0 RR SHOCK M
241	241	0	C	0	0	C	0	0	0 RR SHOCK M
242	242	0	C	C	0	C	C	0	0 LF SHOCK M
243	243	-242	-244	0	0	C	0	0	0 LF SHOCK M
244	244	0	0	0	C	C	0	C	0 LF SHOCK M
245	245	0	C	0	C	C	0	0	0 LR SHOCK M
246	246	-245	-247	0	0	C	0	0	0 LR SHOCK M
247	247	0	C	C	C	C	0	0	0 LR SHOCK M

TABLE A-II. REGION DATA FOR MEP G21A GENERATOR(CONTINUED)

REG NUM	REGION COMBINATION DATA									REMARKS
248	248	-249	0	0	0	0	0	0	0	CRADLE
249	249	0	0	0	0	0	0	0	0	CRADLE AIR
250	250	0	0	0	0	0	0	0	0	ENG SUPPORT
251	251	0	0	0	0	0	0	0	0	ENG SUPPORT
252	252	0	0	0	0	0	0	0	0	GEN SUPPORT
253	253	-278	-279	-280	-281	0	0	0	0	RIGHT SKID
254	254	0	0	0	0	0	0	0	0	RTSIDFRAME
255	255	0	0	0	0	0	0	0	0	RTSIDFRAME
256	256	0	0	0	0	0	0	0	0	RTSIDFRAME
257	257	0	0	0	0	0	0	0	0	RTSIDFRAME
258	258	-278	-279	-280	-281	0	0	0	0	LEFT SKID
259	259	0	0	0	0	0	0	0	0	LTSIDFRAME
260	260	0	0	0	0	0	0	0	0	LTSIDFRAME
261	261	0	0	0	0	0	0	0	0	LTSIDFRAME
262	262	0	0	0	0	0	0	0	0	LTSIDFRAME
263	263	0	0	0	0	0	0	0	0	FCROSSFRAME
264	264	0	0	0	0	0	0	0	0	RCROSSFRAME
265	265	-237	0	0	0	0	0	0	0	RFSHOCKABS
266	266	-240	0	0	0	0	0	0	0	RRSHOCKABS
267	267	-243	0	0	0	0	0	0	0	LFSHOCKABS
268	268	-246	0	0	0	0	0	0	0	LRSHOCKABS
269	269	-270	0	0	0	0	0	0	0	RIGHTCOVER
270	270	0	0	0	0	0	0	0	0	RT COV AIR
271	271	-222	-226	0	0	0	0	0	0	RTSIDE COV
272	272	-273	0	0	0	0	0	0	0	LEFT COVER
273	273	0	0	0	0	0	0	0	0	LT COV AIR
274	274	-230	-234	0	0	0	0	0	0	LTSIDE COV
275	275	-100	0	0	0	0	0	0	0	MIDDLE COV
276	276	0	0	0	0	0	0	0	0	RIGHT STIF
277	277	0	0	0	0	0	0	0	0	LEFT STIFF
278	278	-279	0	0	0	0	0	0	0	FRONT PIPE

TABLE A-II. REGION DATA FOR MEP 021A GENERATOR(CONTINUED)

REG NUM	REGION COMBINATION DATA									REMARKS
279	279	0	0	0	0	0	0	0	0	FRONT PAIR
280	280	-281	0	0	0	0	0	0	0	REAR PIPE
281	281	0	0	0	0	0	0	0	0	REAR PAIR
282	282	-161	0	0	0	0	0	0	0	FUEL

TABLE A-III. REGION IDENTIFICATION FOR MEP G21A GENERATOR

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LOS PERCENT
1	1	C	CRANKSHAFT	3	100
2	2	C	CAMSHAFT	3	100
3	3	C	1C-ROD CRANKSHAFT	3	100
4	4	C	1C-ROD PISTON	3	100
5	5	C	1BLOCK	5	100
6	0	5	1AIR C-ROD	C	0
7	7	C	1PISTON	5	100
8	C	5	1AIR EXPLOS	C	0
9	9	C	1VALVE COVE	1	100
10	C	5	1AIR IN	0	0
11	11	C	1VALVE IN	3	100
12	12	C	1PUSH R IN	3	100
13	13	C	1PUSH R IN	3	100
14	14	C	1PUSH R IN	3	100
15	15	C	1DIVIDER	1	100
16	0	5	1AIR EXHAUST	0	0
17	17	C	1VALVE EXHAUST	3	100
18	18	C	1PUSH R EXHAUST	3	100
19	19	C	1PUSH R EXHAUST	3	100
20	20	C	1PUSH R EXHAUST	3	100
21	21	C	1SPARK PL	1	80
22	22	C	1VAL SPR IN	3	100
23	C	5	1SPR AIR IN	0	0
24	24	C	1VAL SPR EX	3	100
25	C	5	1SPR AIR EX	0	0
26	26	C	2C-ROD CRANKSHAFT	3	100
27	27	C	2C-ROD PISTON	3	100
28	C	5	2AIR C-ROD	0	0
29	29	C	2PISTON	5	100
30	C	5	2AIR EXPLOS	0	0
31	31	C	2VALVE COVE	1	100

TABLE A-III. REGION IDENTIFICATION FOR MEP C21A GENERATOR(CONTINUED)

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LOS PERCENT
32	C	5	2AIR IN	0	0
33	33	C	2VALVE IN	3	100
34	34	0	2PUSH R IN	3	100
35	35	C	2PUSH R IN	3	100
36	36	C	2PUSH P IN	3	100
37	37	C	2DIVIDER	1	100
38	C	5	2AIR EXHAUST	0	0
39	39	C	2VALVE EXHAUST	3	100
40	40	0	2PUSH R EXHAUST	3	100
41	41	0	2PUSH R EXHAUST	3	100
42	42	C	2PUSH R EXHAUST	3	100
43	43	C	2SPARK PL	1	80
44	44	0	2VAL SPR IN	3	100
45	C	5	2SPR AIR IN	0	0
46	46	C	2VAL SPR EX	3	100
47	C	5	2SPR AIR EX	0	0
48	48	0	3C-ROD CR	3	100
49	49	C	3C-ROD PI	3	100
50	50	C	34BLOCK	5	100
51	C	5	3AIR C-ROD	0	0
52	52	0	3PISTON	5	100
53	C	5	3AIR EXPLOS	0	0
54	54	0	3VALVE COVER	1	100
55	0	5	3AIR EXHAUST	0	0
56	56	0	3VALVE EXHAUST	3	100
57	57	0	3PUSH R EXH	3	100
58	58	C	3PUSH R EXH	3	100
59	59	C	3PUSH R EXH	3	100
60	60	C	3DIVIDER	1	100
61	0	5	3AIR IN	0	0
62	62	0	3VALVE IN	3	100

TABLE A-III. REGION IDENTIFICATION FOR MEP 021A GENERATOR (CONTINUED)

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LOS PERCENT
63	63	0	3PUSH R IN	3	100
64	64	0	3PUSH R IN	3	100
65	65	0	3PUSH R IN	3	100
66	66	0	3SPARK PLUG	1	80
67	67	0	3VAL SPR EXH	3	100
68	0	5	3SPR AIR EXH	0	0
69	69	0	3VAL SPR IN	3	100
70	0	5	3SPR AIR IN	0	0
71	71	0	4C-ROD CR	3	100
72	72	0	4C-ROD PI	3	100
73	0	5	4AIR C-ROD	0	0
74	74	0	4PISTON	5	100
75	0	5	4AIR EXPLOS	0	0
76	76	0	4VALVE COVER	1	100
77	0	5	4AIR EXHAUST	0	0
78	78	0	4VALVE EXHAUST	3	100
79	79	0	4PUSH R EXH	3	100
80	80	0	4PUSH R EXH	3	100
81	81	0	4PUSH R EXH	3	100
82	82	0	4DIVIDER	1	100
83	0	5	4AIR IN	0	0
84	84	0	4VALVE IN	3	100
85	85	0	4PUSH R IN	3	100
86	86	0	4PUSH R IN	3	100
87	87	0	4PUSH R IN	3	100
88	88	0	4SPARK PLUG	1	80
89	89	0	4VAL SPR EXH	3	100
90	0	5	4SPR AIR EXH	0	0
91	91	0	4VAL SPR IN	3	100
92	0	5	4SPR AIR IN	0	0
93	93	0	AIRFLT	5	100

TABLE A-III. REGION IDENTIFICATION FOR MEP C21A GENERATOR(CONTINUED)

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LOS PERCENT
94	C	5	AIRFILT AIR	0	0
95	95	C	AF-CARB P	5	12
96	96	0	AF-CARB P	5	12
97	97	0	AF-CARB P	5	12
98	98	C	CARB	5	35
99	99	C	CARB-PLC P	5	12
100	100	0	CARB-PLC P	5	12
101	101	0	INTAKE PLC	5	20
102	102	0	1INTAKE P	5	12
103	103	0	1INTAKE P	5	12
104	104	0	1INTAKE P	5	12
105	105	3	2INTAKE P	5	12
106	106	0	2INTAKE P	5	12
107	107	0	2INTAKE P	5	12
108	108	0	3INTAKE P	5	12
109	109	0	3INTAKE P	5	12
110	110	0	3INTAKE P	5	12
111	283	0	4INTAKE P	5	12
112	112	0	4INTAKE P	5	12
113	113	0	4INTAKE P	5	12
114	114	0	12MUFFLER	1	20
115	115	C	12EXH P	1	8
116	116	0	12EXH P	1	8
117	117	C	2EXH P	1	8
118	118	0	2EXH P	1	8
119	119	C	1EXH P	1	8
120	120	0	1EXH P	1	8
121	121	C	34MUFFLER	1	20
122	122	C	34EXH P	1	8
123	123	C	34EXH P	1	8
124	124	0	4EXH P	1	8

TABLE A-III. REGION IDENTIFICATION FOR MEP C21A GENERATOR(CONTINUED)

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LOS PERCENT
125	125	C	4EXH P	1	8
126	126	O	3EXH P	1	8
127	127	C	3EXH P	1	8
128	128	O	MAGNETO	1	60
129	129	O	1SPK PLU C	7	40
130	130	O	1SPK PLU C	7	40
131	131	O	1SPK PLU C	7	40
132	132	O	1SPK PLU C	7	40
133	133	O	2SPK PLU C	7	40
134	134	O	2SPK PLU C	7	40
135	135	O	2SPK PLU C	7	40
136	136	O	2SPK PLU C	7	40
137	137	O	3SPK PLU C	7	40
138	138	O	3SPK PLU C	7	40
139	139	O	3SPK PLU C	7	40
140	140	C	3SPK PLU C	7	40
141	141	O	4SPK PLU C	7	40
142	142	C	4SPK PLU C	7	40
143	143	O	4SPK PLU C	7	40
144	144	C	4SPK PLU C	7	40
145	145	O	MAG-IPTS C	7	40
146	146	C	MAG-IPTS C	7	40
147	147	O	IGNIT PTS	5	50
148	148	C	OIL FILTER	5	25
149	149	O	OILF-PUM P	5	20
150	150	C	OILF-PUM P	5	20
151	151	O	GOV OILL P	7	20
152	152	C	GOV OILL P	7	20
153	153	C	GOV OILL P	7	20
154	154	O	GOV OILL P	7	20
155	155	O	GOVERNOR	5	50

TABLE A-III. REGION IDENTIFICATION FOR MEP 021A GENERATOR(CONTINUED)

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LDS PERCENT
156	156	0	GOVCARB LK	1	100
157	157	0	GOVCARB LK	1	100
158	158	0	GOVCARB LK	1	100
159	159	0	GOVCARB LK	1	100
160	160	0	FUEL TANK	5	100
161	0	5	FUEL T AIR	0	0
162	162	0	FUE LIN P	7	20
163	163	0	FUE LIN P	7	20
164	164	0	FUE LIN P	7	20
165	165	0	FUE LIN P	7	20
166	166	0	FUE LIN P	7	20
167	167	0	FUEL VALVE	5	50
168	168	0	FUEL FILTE	5	30
169	169	0	FUEL F-P P	7	20
170	170	0	FUEL F-P P	7	20
171	171	0	FUEL F-P P	7	20
172	172	0	FUEL F-P P	7	20
173	173	0	FUEL F-P P	7	20
174	174	0	FUEL F-P P	7	20
175	175	0	FUEL PUMP	5	50
176	176	0	FUEL P-C P	7	20
177	177	0	FUEL P-C P	7	20
178	178	0	FUEL P-C P	7	20
179	179	0	VENTILPLEN	5	100
180	0	5	VENPLE AIR	0	0
181	181	0	VENTIL FAN	5	60
182	182	0	VENTIL FAN	5	60
183	183	0	FANHOUSING	5	100
184	0	5	FANHOU AIR	0	0
185	185	0	GENHOUSING	5	100
186	0	5	GENHOU AIR	0	0

TABLE A-III. REGION IDENTIFICATION FOR MEP C21A GENERATOR(CONTINUED)

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LOS PERCENT
187	0	5	GENHOU AIR	0	0
188	0	5	AIR VENT	0	0
189	0	5	AIR VENT	0	0
190	0	5	AIR VENT	0	0
191	0	5	AIR VENT	0	0
192	192	0	BEARING	1	100
193	193	0	GENERATOR	1	100
194	194	0	GENEXCITER	1	100
195	195	0	CB CHASSIS	5	100
196	196	0	CB CHASSIS	5	100
197	0	5	CB CHA AIR	0	0
198	198	0	CB CHASSIS	5	100
199	199	0	CONTROLBOX	5	100
200	0	5	CB AIR	0	0
201	201	0	CB FLAP	5	100
202	202	0	GEN CB C	7	40
203	203	0	CB C	7	40
204	204	0	CB C	7	40
205	205	0	CB C	7	40
206	206	0	CB C	7	40
207	207	0	CB C	7	40
208	208	0	CB OUTTERM	7	100
209	209	0	CB C	7	40
210	210	0	CB C	7	40
211	211	0	CB CKTBREA	14	100
212	212	0	EXCIT CB C	7	40
213	213	0	OIL PUMP	5	80
214	214	0	CAM DRIVE	5	80
215	215	0	END PLATE	5	100
216	216	0	CAM COVER	5	100
217	0	5	CAM COVAIR	0	0

TABLE A-III. REGION IDENTIFICATION FOR MEP C21A GENERATOR (CONTINUED)

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LOS PERCENT
218	218	0	OIL PAN	5	100
219	0	5	OIL PAN AIR	0	0
220	220	0	1PRCOV INT	5	10
221	221	0	1PRCOV EXH	5	10
222	222	0	1VALSPRCOV	5	100
223	0	5	1VALSPCAIR	0	0
224	224	0	2PRCOV INT	5	10
225	225	0	2PRCOV EXH	5	10
226	226	0	2VALSPRCOV	5	100
227	0	5	2VALSPCAIR	0	0
228	228	0	3PRCOV EXH	5	10
229	229	0	3PRCOV INT	5	10
230	230	0	3VALSPRCOV	5	100
231	0	5	3VALSPCAIR	0	0
232	232	0	4PRCOV EXH	5	10
233	233	0	4PRCOV INT	5	10
234	234	0	4VALSPRCOV	5	100
235	0	5	4VALSPCAIR	0	0
236	236	0	RF SHOCK M	5	100
237	237	0	RF SHOCK M	5	100
238	238	0	RF SHOCK M	5	100
239	239	0	RR SHOCK M	5	100
240	240	0	RR SHOCK M	5	100
241	241	0	RR SHOCK M	5	100
242	242	0	LF SHOCK M	5	100
243	243	0	LF SHOCK M	5	100
244	244	0	LF SHOCK M	5	100
245	245	0	LR SHOCK M	5	100
246	246	0	LR SHOCK M	5	100
247	247	0	LR SHOCK M	5	100
248	248	0	CRADLE	5	100

TABLE A-III. REGION IDENTIFICATION FOR MEP 021A GENERATOR(CONTINUED)

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LOS PERCENT
249	0	5	CRADLE AIR	0	0
250	250	0	ENGSUPPORT	5	100
251	251	0	ENGSUPPORT	5	100
252	252	0	GENSUPPORT	5	100
253	253	0	RIGHT SKID	5	40
254	254	0	RTSIDFRAME	5	20
255	255	0	RTSIDFRAME	5	20
256	256	0	RTSIDFRAME	5	20
257	257	0	RTSIDFRAME	5	20
258	258	0	LEFT SKID	5	40
259	259	0	LTSIDFRAME	5	20
260	260	0	LTSIDFRAME	5	20
261	261	0	LTSIDFRAME	5	20
262	262	0	LTSIDFRAME	5	20
263	263	0	FCROSSFRAME	5	20
264	264	0	RCROSSFRAME	5	20
265	265	0	RFSHOCKABS	18	80
266	266	0	RRSHOCKABS	18	80
267	267	0	LFSHOCKABS	18	80
268	268	0	LRSHOCKABS	16	80
269	269	0	RIGHTCOVER	5	100
270	0	5	RT COV AIR	0	0
271	271	0	RTSIDE COV	5	100
272	272	0	LEFT COVER	5	100
273	0	5	LT COV AIR	0	0
274	274	0	LTSIDE COV	5	100
275	275	0	MIDDLE COV	5	100
276	276	0	RIGHT STIF	5	60
277	277	0	LEFT STIFF	5	60
278	278	0	FRONT PIPE	5	100
279	0	5	FRONT PAIR	0	0

TABLE A-III. REGION IDENTIFICATION FOR MEP 021A GENERATOR(CONTINUED)

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LOS PERCENT
280	280	0	REAR PIPE	5	100
281	0	5	REAR PLAIR	0	0
282	282	0	FUEL	25	100

TABLE A-IV. REGION IDENTIFICATION FOR MEP 021A GENERATOR
ORDERED BY ITEM NUMBER

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LOS PERCENT
6	C	5	1AIR C-ROD	0	0
8	C	5	1AIR EXPLOS	0	0
10	C	5	1AIR IN	0	0
16	C	5	1AIR EXHAUST	0	0
23	C	5	1SPR AIR IN	0	0
25	C	5	1SPR AIR EX	0	0
28	C	5	2AIR C-ROD	0	0
30	C	5	2AIR EXPLOS	0	0
32	C	5	2AIR IN	0	0
38	C	5	2AIR EXHAUST	0	0
45	C	5	2SPR AIR IN	0	0
47	C	5	2SPR AIR EX	0	0
51	C	5	3AIR C-ROD	0	0
53	C	5	3AIR EXPLOS	0	0
55	C	5	3AIR EXHAUST	0	0
61	C	5	3AIR IN	0	0
68	C	5	3SPR AIR EXH	0	0
70	C	5	3SPR AIR IN	0	0
73	C	5	4AIR C-ROD	0	0
75	C	5	4AIR EXPLOS	0	0
77	C	5	4AIR EXHAUST	0	0
83	C	5	4AIR IN	0	0
90	C	5	4SPR AIR EXH	0	0
92	C	5	4SPR AIR IN	0	0
94	C	5	AIRFILT AIR	0	0
161	C	5	FUEL T AIR	0	0
180	C	5	VENPLE AIR	0	0
184	C	5	FANHOU AIR	0	0
186	C	5	GENHOU AIR	0	0
187	C	5	GENHOU AIR	0	0

TABLE A-IV. REGION IDENTIFICATION FOR MEP Q21A GENERATOR
ORDERED BY ITEM NUMBER (CONTINUED)

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LOS PERCENT
188	0	5	AIR VENT	0	0
189	0	5	AIR VENT	0	0
190	0	5	AIR VENT	0	0
191	0	5	AIR VENT	0	0
197	0	5	CB CHA AIR	0	0
200	0	5	CB AIR	0	0
217	0	5	CAM COVAIR	0	0
219	0	5	OIL PANAIR	0	0
223	0	5	1VALSPCAIR	0	0
227	0	5	2VALSPCAIR	0	0
231	0	5	3VALSPCAIR	0	0
235	0	5	4VALSPCAIR	0	0
249	0	5	CRADLE AIR	0	0
270	0	5	RT COV AIR	0	0
273	0	5	LT COV AIR	0	0
279	0	5	FRONT PAIR	0	0
281	0	5	REAR PIAIR	0	0
1	1	0	CRANKSHAFT	3	100
2	2	0	CAMSHAFT	3	100
3	3	0	1C-ROD CRANKSHAFT	3	100
4	4	0	1C-ROD PISTON	3	100
5	5	0	1BLOCK	5	100
7	7	0	1PISTON	5	100
9	9	0	1VALVE COVE	1	100
11	11	0	1VALVE IN	3	100
12	12	0	1PUSH R IN	3	100
13	13	0	1PUSH R IN	3	100
14	14	0	1PUSH R IN	3	100
15	15	0	1DIVIDER	1	100
17	17	0	1VALVE EXHAUST	3	100

TABLE A-IV. REGION IDENTIFICATION FOR MEP 021A GENERATOR
ORDERED BY ITEM NUMBER (CONTINUED)

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LOS PERCENT
18	18	0	1PUSH R EXHAUST	3	100
19	19	0	1PUSH R EXHAUST	3	100
20	20	0	1PUSH R EXHAUST	3	100
21	21	0	1SPARK PL	1	80
22	22	0	1VAL SPR IN	3	100
24	24	0	1VAL SPR EX	3	100
26	26	0	2C-ROD CRANKSHAFT	3	100
27	27	0	2C-ROD PISTON	3	100
29	29	0	2PISTON	5	100
31	31	0	2VALVE COVE	1	100
33	33	0	2VALVE IN	3	100
34	34	0	2PUSH R IN	3	100
35	35	0	2PUSH R IN	3	100
36	36	0	2PUSH R IN	3	100
37	37	0	2DIVIDER	1	100
39	39	0	2VALVE EXHAUST	3	100
40	40	0	2PUSH R EXHAUST	3	100
41	41	0	2PUSH R EXHAUST	3	100
42	42	0	2PUSH R EXHAUST	3	100
43	43	0	2SPARK PL	1	80
44	44	0	2VAL SPR IN	3	100
46	46	0	2VAL SPR EX	3	100
48	48	0	3C-ROD CR	3	100
49	49	0	3C-ROD PI	3	100
50	50	0	34BLOCK	5	100
52	52	0	3PISTON	5	100
54	54	0	3VALVE COVER	1	100
56	56	0	3VALVE EXHAUST	3	100
57	57	0	3PUSH R EXH	3	100
58	58	0	3PUSH R EXH	3	100

TABLE A-IV. REGION IDENTIFICATION FOR MEP 021A GENERATOR
ORDERED BY ITEM NUMBER (CONTINUED)

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LOS PERCENT
59	59	0	3PUSH R EXH	3	100
60	60	0	3DIVIDER	1	100
62	62	0	3VALVE IN	3	100
63	63	0	3PUSH R IN	3	100
64	64	C	3PUSH R IN	3	100
65	65	0	3PUSH R IN	3	100
66	66	C	3SPARK PLUG	1	80
67	67	0	3VAL SPR EXH	3	100
69	69	0	3VAL SPR IN	3	100
71	71	0	4C-ROD CR	3	100
72	72	0	4C-ROD PI	3	100
74	74	C	4PISTON	5	100
76	76	C	4VALVE COVER	1	100
78	78	0	4VALVE EXHAUST	3	100
79	79	0	4PUSH R EXH	3	100
80	80	0	4PUSH R EXH	3	100
81	81	0	4PUSH R EXH	3	100
82	82	0	4DIVIDER	1	100
84	84	0	4VALVE IN	3	100
85	85	0	4PUSH R IN	3	100
86	86	C	4PUSH R IN	3	100
87	87	C	4PUSH R IN	3	100
88	88	C	4SPARK PLUG	1	80
89	89	0	4VAL SPR EXH	3	100
91	91	0	4VAL SPR IN	3	100
93	93	0	AIRFILT	5	100
95	95	0	AF-CARB P	5	12
96	96	0	AF-CARB P	5	12
97	97	C	AF-CARB P	5	12
98	98	C	CARB	5	35

TABLE A-IV. REGION IDENTIFICATION FOR MEP 021A GENERATOR
ORDERED BY ITEM NUMBER (CONTINUED)

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LOS PERCENT
99	99	O	CARB-PLC P	5	12
100	100	O	CARB-PLC P	5	12
101	101	C	INTAKE PLC	5	20
102	102	O	1INTAKE P	5	12
103	103	C	1INTAKE P	5	12
104	104	O	1INTAKE P	5	12
105	105	O	2INTAKE P	5	12
106	106	O	2INTAKE P	5	12
107	107	O	2INTAKE P	5	12
108	108	O	3INTAKE P	5	12
109	109	O	3INTAKE P	5	12
110	110	O	3INTAKE P	5	12
112	112	C	4INTAKE P	5	12
113	113	C	4INTAKE P	5	12
114	114	O	12MUFFLER	1	20
115	115	O	12EXH P	1	8
116	116	O	12EXH P	1	8
117	117	O	2EXH P	1	8
118	118	C	2EXH P	1	8
119	119	C	1EXH P	1	8
120	120	O	1EXH P	1	8
121	121	O	34MUFFLER	1	20
122	122	O	34EXH P	1	8
123	123	C	34EXH P	1	8
124	124	C	4EXH P	1	8
125	125	O	4EXH P	1	8
126	126	C	3EXH P	1	8
127	127	C	3EXH P	1	8
128	128	O	MAGNETO	1	60
129	129	O	1SPK PLU C	7	40

TABLE A-IV. REGION IDENTIFICATION FOR MEP 021A GENERATOR
ORDERED BY ITEM NUMBER (CONTINUED)

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LDS PERCENT
130	130	C	1SPK PLU C	7	40
131	131	C	1SPK PLU C	7	40
132	132	C	1SPK PLU C	7	40
133	133	C	2SPK PLU C	7	40
134	134	C	2SPK PLU C	7	40
135	135	C	2SPK PLU C	7	40
136	136	C	2SPK PLU C	7	40
137	137	C	3SPK PLU C	7	40
138	138	C	3SPK PLU C	7	40
139	139	C	3SPK PLU C	7	40
140	140	C	3SPK PLU C	7	40
141	141	C	4SPK PLU C	7	40
142	142	C	4SPK PLU C	7	40
143	143	C	4SPK PLU C	7	40
144	144	C	4SPK PLU C	7	40
145	145	C	MAG-IPTS C	7	40
146	146	C	MAG-IPTS C	7	40
147	147	C	IGNIT PTS	5	50
148	148	C	OIL FITER	5	25
149	149	C	OILF-PUM P	5	20
150	150	C	OILF-PUM P	5	20
151	151	C	GOV OILL P	7	20
152	152	C	GOV OILL P	7	20
153	153	C	GOV OILL P	7	20
154	154	C	GOV OILL P	7	20
155	155	C	GOVERNOR	5	50
156	156	C	GOVCARB LK	1	100
157	157	C	GOVCARB LK	1	100
158	158	C	GOVCARB LK	1	100
159	159	C	GOVCARB LK	1	100

TABLE A-IV. REGION IDENTIFICATION FOR MEP 021A GENERATOR
ORDERED BY ITEM NUMBER (CONTINUED)

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LOS PERCENT
160	160	O	FUEL TANK	5	100
162	162	O	FUE LIN P	7	20
163	163	O	FUE LIN P	7	20
164	164	O	FUE LIN P	7	20
165	165	O	FUE LIN P	7	20
166	166	O	FUE LIN P	7	20
167	167	O	FUEL VALVE	5	50
168	168	O	FUEL FILTE	5	30
169	169	O	FUEL F-P P	7	20
170	170	O	FUEL F-P P	7	20
171	171	O	FUEL F-P P	7	20
172	172	O	FUEL F-P P	7	20
173	173	O	FUEL F-P P	7	20
174	174	O	FUEL F-P P	7	20
175	175	O	FUEL PUMP	5	50
176	176	O	FUEL P-C P	7	20
177	177	O	FUEL P-C P	7	20
178	178	O	FUEL P-C P	7	20
179	179	O	VENTILPLEN	5	100
181	181	O	VENTIL FAN	5	60
182	182	O	VENTIL FAN	5	60
183	183	O	FANHOUSING	5	100
185	185	O	GENHOUSING	5	100
192	192	O	BEARING	1	100
193	193	O	GENERATOR	1	100
194	194	O	GENEXCITER	1	100
195	195	O	CB CHASSIS	5	100
196	196	O	CB CHASSIS	5	100
198	198	O	CB CHASSIS	5	100
199	199	O	CONTRGLBOX	5	100

TABLE A-IV. REGION IDENTIFICATION FOR MEP 021A GENERATOR
ORDERED BY ITEM NUMBER (CONTINUED)

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LOS PERCENT
201	201	0	CB FLAP	5	100
202	202	0	GEN CB C	7	40
203	203	0	CB C	7	40
204	204	0	CB C	7	40
205	205	0	CB C	7	40
206	206	0	CB C	7	40
207	207	0	CB C	7	40
208	208	0	CB OUTTERM	7	100
209	209	0	CB C	7	40
210	210	0	CB C	7	40
211	211	0	CB CKTBREA	14	100
212	212	0	EXCIT CB C	7	40
213	213	0	OIL PUMP	5	80
214	214	0	CAM DRIVE	5	80
215	215	0	END PLATE	5	100
216	216	0	CAM COVER	5	100
218	218	0	OIL PAN	5	100
220	220	0	1PRCOV INT	5	10
221	221	0	1PRCOV EXH	5	10
222	222	0	1VALSPRCOV	5	100
224	224	0	2PRCOV INT	5	10
225	225	0	2PRCOV EXH	5	10
226	226	0	2VALSPRCOV	5	100
228	228	0	3PRCOV EXH	5	10
229	229	0	3PRCOV INT	5	10
230	230	0	3VALSPRCOV	5	100
232	232	0	4PRCOV EXH	5	10
233	233	0	4PRCOV INT	5	10
234	234	0	4VALSPRCOV	5	100
236	236	0	RF SHOCK M	5	100

TABLE A-IV. REGION IDENTIFICATION FOR MEP 021A GENERATOR
ORDERED BY ITEM NUMBER (CONTINUED)

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LOS PERCENT
237	237	O	RF SHOCK M	5	100
238	238	C	RF SHOCK M	5	100
239	239	O	RR SHOCK M	5	100
240	240	C	RR SHOCK M	5	100
241	241	C	RR SHOCK M	5	100
242	242	O	LF SHOCK M	5	100
243	243	C	LF SHOCK M	5	100
244	244	O	LF SHOCK M	5	100
245	245	O	LR SHOCK M	5	100
246	246	O	LR SHOCK M	5	100
247	247	C	LR SHOCK M	5	100
248	248	O	CRADLE	5	100
250	250	O	ENG SUPPORT	5	100
251	251	C	ENG SUPPORT	5	100
252	252	O	ENG SUPPORT	5	100
253	253	C	RIGHT SKID	5	40
254	254	O	RTSIDFRAME	5	20
255	255	C	RTSIDFRAME	5	20
256	256	O	RTSIDFRAME	5	20
257	257	O	RTSIDFRAME	5	20
258	258	O	LEFT SKID	5	40
259	259	C	LTSIDFRAME	5	20
260	260	O	LTSIDFRAME	5	20
261	261	O	LTSIDFRAME	5	20
262	262	O	LTSIDFRAME	5	20
263	263	C	FCROSSFRAME	5	20
264	264	C	RCROSSFRAME	5	20
265	265	C	RFSHOCKABS	18	80
266	266	C	RRSHOCKABS	18	80
267	267	O	LFSHOCKABS	18	80

TABLE A-IV. REGION IDENTIFICATION FOR MEP 021A GENERATOR
ORDERED BY ITEM NUMBER (CONTINUED)

REGION NUM	ITEM CODE	SPACE CODE	DESCRIPTION	MATERIAL CODE	LOS PERCENT
268	268	0	LRSHOCKABS	18	80
269	269	0	RIGHTCOVER	5	100
271	271	0	RTSIDE COV	5	100
272	272	0	LEFT COVER	5	100
274	274	0	LTSIDE COV	5	100
275	275	0	MIDDLE COV	5	100
276	276	0	RIGHT STIF	5	60
277	277	0	LEFT STIFF	5	60
278	278	0	FRONT PIPE	5	100
280	280	0	REAR PIPE	5	100
282	282	0	FUEL	25	100
111	283	0	4INTAKE P	5	12

APPENDIX B
COMBINATORIAL GEOMETRY BACKGROUND

APPENDIX B

COMBINATORIAL GEOMETRY BACKGROUND

The GIFT computer code requires a (COM-GEOM) target description as input data. Familiarization with the COM-GEOM technique and terminology is required to understand the description of the MEP-021A Generator Set presented in this report. The following is a brief introduction to the COM-GEOM technique of target description. Reference 1 gives a more detailed account of the COM-GEOM method as required for input to the GIFT code.

Engineering drawings, manuals, photographs or other descriptive material are required to produce a COM-GEOM description. The COM-GEOM technique utilized twelve basic geometric solids combined under three set-theory type operations to define the shape and location of each component of a target. A complete COM-GEOM description contains three distinct parts: a solid table, a region table and a region identification table.

A solid is defined as one of the twelve geometric shapes available for COM-GEOM descriptions (See Table B-1). The parameters of a solid give its location, size, and orientation within the coordinate system established for the target. Each solid is uniquely numbered and its parameters listed in the solid table.

A region is the space occupied by a single solid or combination of solids. Solids are combined using the three operations:

intersection (+), union (OR), and difference (-).

The intersection (+) of two solids is defined as the space in common with both solids. The union (OR) of two solids is defined as the space in either of the solids. The difference (-) of two solids is defined as the space of the first solid minus the space of the second solid. Figure B-1 is a two-dimensional graphic illustration of these three operations. Any number of solids from the solid table may be used to define a region. Each region is uniquely numbered and its defining combination of solids is listed in the region table.

Table B-1. Geometric Solids Used in COM-GEOM Descriptions

<u>SYMBOL</u>	<u>SOLID NAME</u>
RPP	Rectangular Parallelepiped
BOX	Box
RAW	Right Angle Wedge
ARB	Arbitrary Convex Polyhedron
ARS	Triangular Surfaced Polyhedron
ELL	Ellipsoid of Revolution
SPH	Sphere
RCC	Right Circular Cylinder
REC	Right Elliptical Cylinder
TRC	Truncated Right Angle Cone
TEC	Truncated Elliptic Cone
TOR	Torus

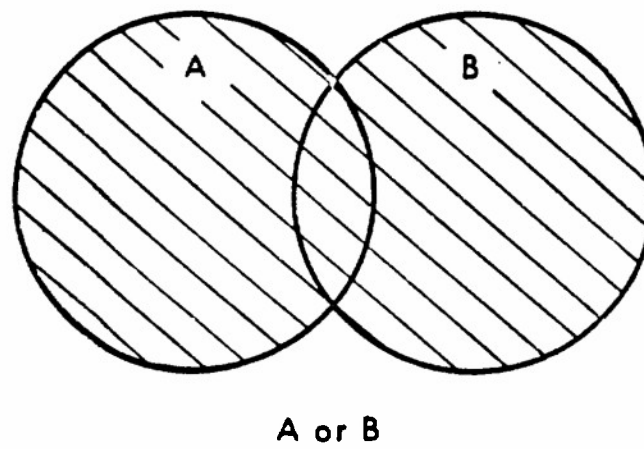
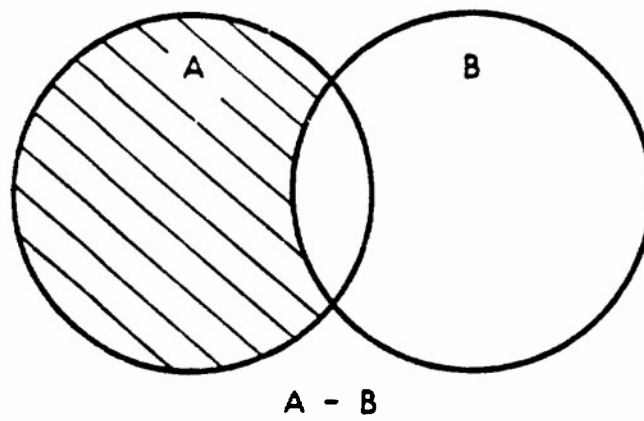
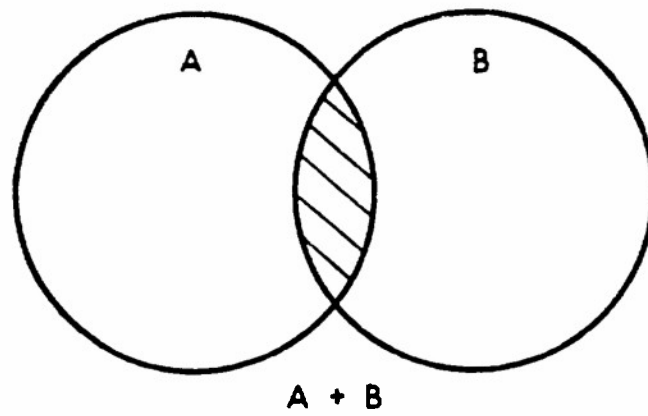


Figure B-1. INTERSECTION (+), SUBTRACTION (-), UNION (OR) OF SOLIDS

In the region identification table, each region is assigned an identification code number. These code numbers either identify each specific region as a component of the target or as an air space. Space not described as a region is assigned the air space code "01" by the GIFT code by default. In many targets, it is important to distinguish between inside and outside air. For these targets, all interior space is described as a region and identified as inside air, leaving the 01 space code for outside air only. The RAYAIR subroutine of the GIFT code allows any region identified with a space code to overlap any region identified with an item code or the same space code. However, regions with different space code numbers cannot overlap.

The region identification table also allows 40 alphanumeric characters of descriptive data per region. The vulnerability analyst needs to know the type and percentage of material making up each region. The percentage value is used to produce an equivalent line-of-sight (LOS) thickness of the material type. It has become common practice to include this information in the 40 characters of descriptive data in the region identification table. In the MEP-021A description, the last three digits represent the percentage of material, while the two preceding digits are a code indicating the material type. Table B-2 lists the two-digit material codes used in this description.

Table B-2. Material Codes and Densities for the MEP-021A Description

<u>Code</u>	<u>Density (gm/cm³)</u>	<u>Material</u>
1	7.7641	Mild Steel
3	7.7641	Face Hardened Steel
5	2.7695	Aluminum
7	8.9007	Copper
14	1.2166	Plexiglas as Cast
18	0.9356	Rubber
25	0.6809	Gasoline

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